



User Manual

ECTHA PRO

Version 2.0

Copyright © 2015 DRC Srl

Table of Contents




1. About us	4
2. Equipment	5
3. Support	6
4. Registration	8
5. Order	9
6. Ectha Pro	10
6.1 General Safety	10
6.2 Aim and limits	11
6.3 Getting to know	11
6.4 Safety transport cup	13
6.5 How it works	15
6.6 Performing test	18
6.7 Turn ON-OFF	23
6.8 Record data	26
6.9 Edit function	37
6.10 Blue Tooth	42
6.11 Menu	43
6.11.1 Setting	44
6.11.2 Language	52
6.11.3 USB - SD Card	53
6.11.4 Turn ON - OFF	61
6.11.5 ECTHA PRO	62
6.12 Update and Restore	62
6.13 Diagnostic Log	67

7. Calibration	75
8. Standards	77
9. Curves	78
10. Accessories	85
11. Technical Data	87
11.1 Explosion view	88
12. Video Instruction	90
13. Download area	91
14. Software and APP	92
15. Quick Start Ectha Plus	93
Index	113

1. About us

About Us

DRC Srl designs, manufactures and markets equipment for non-destructive testing and investigations in the field of civil engineering since 1978. DRC Srl is divided into three different divisions:

		
<u>Products NDT</u>	<u>Training</u>	<u>Fatigue Testing Machine</u>

to get more info, visit www.drcitalia.it/en

2. Equipment

Equipment



ECTHA PRO is a new electronic concrete test hammer, result of 30 years of mechanical manufacturer experience and unique Italian design. All units are subjected at calibration and test with [automatic AT machine](#)

ECTHA PRO is able to transmit data with Blue Tooth technology (Blue Tooth 4.2) directly to [ECTHA-R](#) application for Android system

Ectha Pro 2014 is made with new generation of battery. More working time and less time to recharge.

Ectha Pro 2014 include a new analysis and reporting PC [ECTHA - W](#)

3. Support

Support

For any trouble or assistance of DRC equipment, contact DRC Srl assistance service writing at assistenza@drcitalia.it or please contact at skype account drc_custhelp

Fill in [RMA Form](#) for any assistance or maintenance of **Ectha Pro** and enclose it with the equipment when send it back for repair or maintenance. Send the document first by email and then enclose the document with equipment.

When you contact the DRC srl for maintenance issue, please use a follows data to identify the unit.

<i>Type of hammer</i>	<i>Serial number</i>	<i>Calibration date</i>

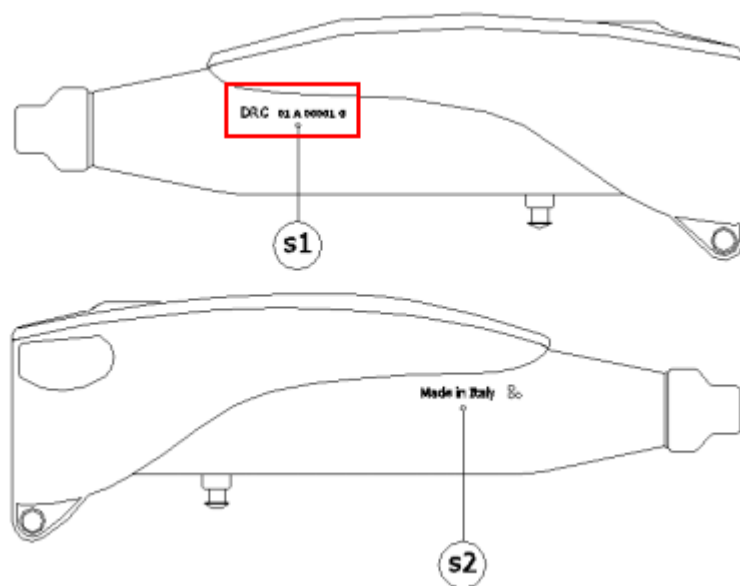
Serial number of concrete test hammer is on the shape of concrete, see image below [S1] while the calibration date is on the label on the opposite site of serial number.

You could see the calibration data also on the Calibration Report enclose on the package.

Il numero di serie dello sclerometro si trova sulla superficie esterna della carcassa (**link immagine**) mentre l' etichetta di taratura è stata collocata nella parte posteriore dello stesso.

Serial number

Calibration Report



DRC
Dipartimento Nazionale Calibrazione
NIST - U.S. Department of Commerce

**RAPPORTO DI TARATURA
CALIBRATION REPORT**

Serial No.	
Ref. Equipment	
Operator	
Date of Calibration	
Report Quality No.	

Rev. 7.5.3.03 Rev.01 11/08

**Sclerometro Meccanico DRC
Concrete Test Hammer DRC**

- Eccha 1000
- Geo Hammer
- Eccha Plus Pro
- Wood Pecker
- SM

La DRC srl certifica che questo strumento è stato testato ed ha superato il nostro controllo di qualità.
DRC srl Company certifies that this instrument has been tested and passed our internal quality control.

La Calibrazione è stata eseguita utilizzando una incudine di riferimento DRC srl.
The Calibration has been carried out according to the testing anvil.

Tutti i valori rilevati rientrano nelle tolleranze specifiche, in accordo con la normativa internazionale UNI EN 12504 - 2, ASTM C805.
All the measured values are within specified tolerance to according with international standards UNI EN 12504 - 2, ASTM C805.

Relazione estesa: Vedi tab. Laboratorio - Test relation : See laboratory List

DRC srl
Via Montebelluna km. 1 - 00171 - Roma - Fax +39 06 1365 318 -
www.drcsrl.it info@drcsrl.it

4. Registration

Registration

DRC Srl innovates and updates continually their hardware and software products.
It's DRC commitment to provide a continuous and long-term support to its customer and user.

In order to receive information and updates, please register your instrument through the [registration area](#).
Receive technical communications and updates regarding exclusively the product purchased and registered.

For information and clarification on this service, feel free to contact our staff at in@drcitalia.it.

5. Order

Order

DRC Srl offer and sell its own range of product directly to the end user in order to maintain and ensure pre and post sales support. DRC Srl product range is also available from our [distributor network](#). Assistance and support are always guaranteed.

For commercial request fill a [Form](#) or visit a [product web page](#)

6. Ectha Pro

Introduction

DRC Srl thanks you for choosing ECTHA PRO. The operating manual that follows has been designed to help you get maximum use from the ECTHA PRO rebound hammer. Read this manual with care before using the instrument and always keep it within reach during investigation phases.

This user manual contains safety regulations as well as all instructions necessary for rebound hammer use and any subsequent processing of the data obtained. To take full advantage of instrument use, please read all instructions carefully.

This document is available in a follows format:

- ▶ Manual .pdf
- ▶ Operating Manual .html

All these manual are available for download on Web Help - **Ectha Pro** [download area](#)

6.1 General Safety

General safety

To prevent the risk of damaging the equipment or provoking damages to the operator or third parties, carefully read the following general safety standards prior to using the concrete test hammer. These standards should always be provided with the instrument, so that it may be consulted at any time by the user/operator. The manufacturer will not assume any responsibility for direct or indirect damages to persons, objects or domestic and non-domestic animals, due to the non-compliance of the safety standards contained in the present documentation.

- ▶ The instrument must be used by adequately trained personnel, in order to avoid the improper use of the equipment.
- ▶ The instrument must be solely used for its destined use for which it was designed
- ▶ The tampering and modification of the instrument is to be considered as negligent and isolates the manufacturer from any responsibility deriving from the misuse.

In such a situation the guarantee for eventual spare parts or calibration verification will immediately cease to exist

- ▶ Do not perform or carry out any type of test with the instrument on any body part of person/s or animal/s: permanent damage and even grievous bodily harm may be caused by the use of the instrument on certain parts of the human/animal body

6.2 Aim and limits

Aim and Limits of Concrete test hammer method

The tests that may be performed on hardened concrete in operation, normal and pre-compressed reinforced concrete, in order to control the quality and estimate the mechanical characteristics the tests are divided into destructive and non-destructive tests. The “mechanical” method for the determination of the surface hardness via the use of the concrete test hammer is among the non-destructive tests. This method is based on the corresponding existence between the unitary load for compression breakage and the surface hardness of the conglomerate, by measuring the remaining elastic energy (rebound method).

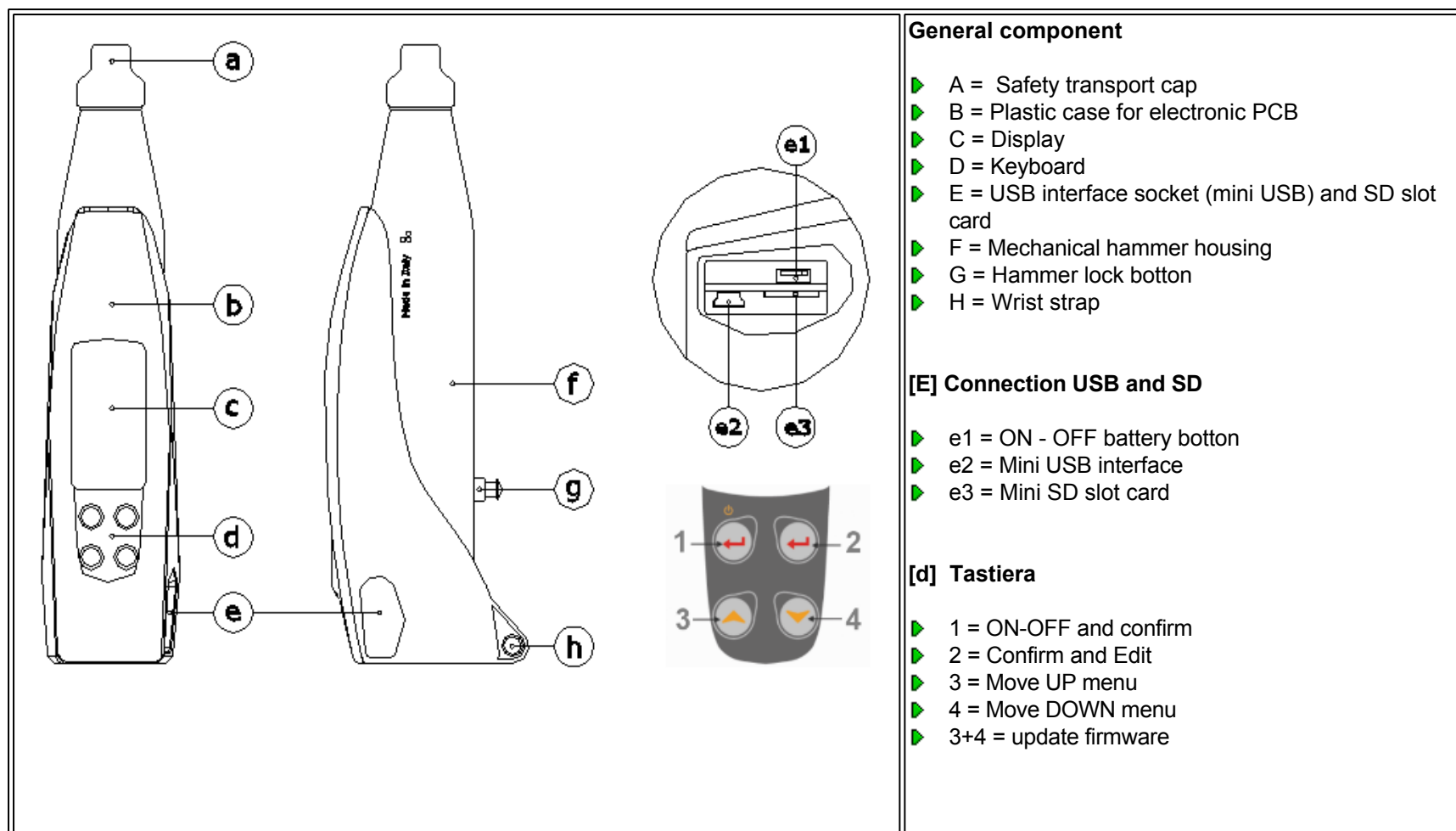
The concrete Test Hammer tests are used to estimate, with due limitations in the procedure, the compression resistance of the concrete in previously constructed structures. In fact the UNI EN 12504 -2:2001 at point 1, note 2, prescribes that the test method is not intended as an alternative for the determination of the resistance to compression of the concrete but, with an appropriate correlation, may provide an estimate of the resistance on site.

The Rebound index determined by this method may be used for the evaluation of the uniformity of the concrete on site, to delineate the zones or areas of poor quality or deteriorated concrete present in the structures.

6.3 Getting to know

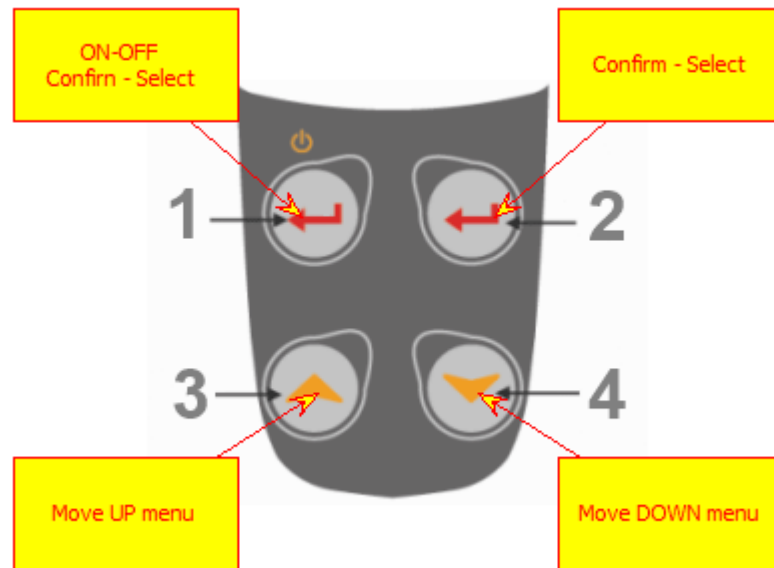
Getting to know

Ectha PRO is made up of a mechanical model "N" rebound hammer with the electronics necessary for data acquisition, analysis and reporting. Below is a diagram of the ECTHA PRO Digital rebound hammer and its main components.



Keyboard

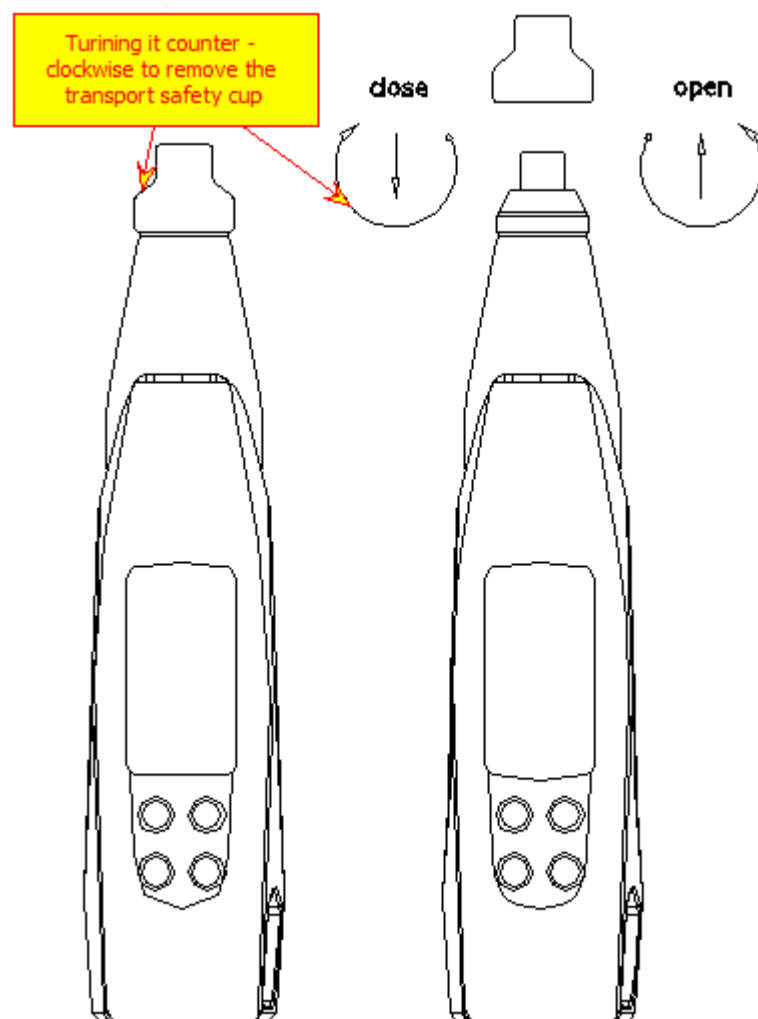
Keyboard is made with 4 buttons through which can manage all functions of the instrument.



6.4 Safety transport cup

Safety transport cup

Concrete test hammer ECTHA PRO is delivered to the end user with the safety transport cup to prevent damage during transport. Remove it before use the concrete test hammer. Do it following below instruction

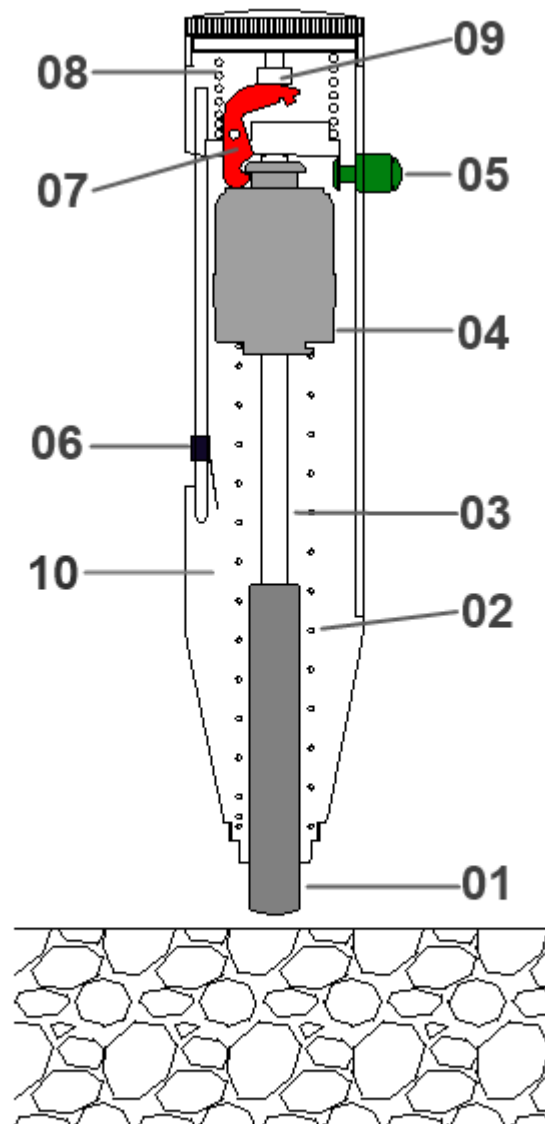


If while you are removing safety cap the ring is removed as well, please follow the procedure showed on the video to restore the hammer as before.
Nel caso durante la rimozione del tappo di sicurezza trasporto viene rimossa anche la ghiera puntale, seguire la procedura video di seguito per il nuovo assemblaggio.

6.5 *How it works*

How it works

The principle for the function of the instrument is that a mass launched from a spring strikes a piston in contact with the surface and the result of the test is expressed in terms of the bouncing distance of the mass.



Components:

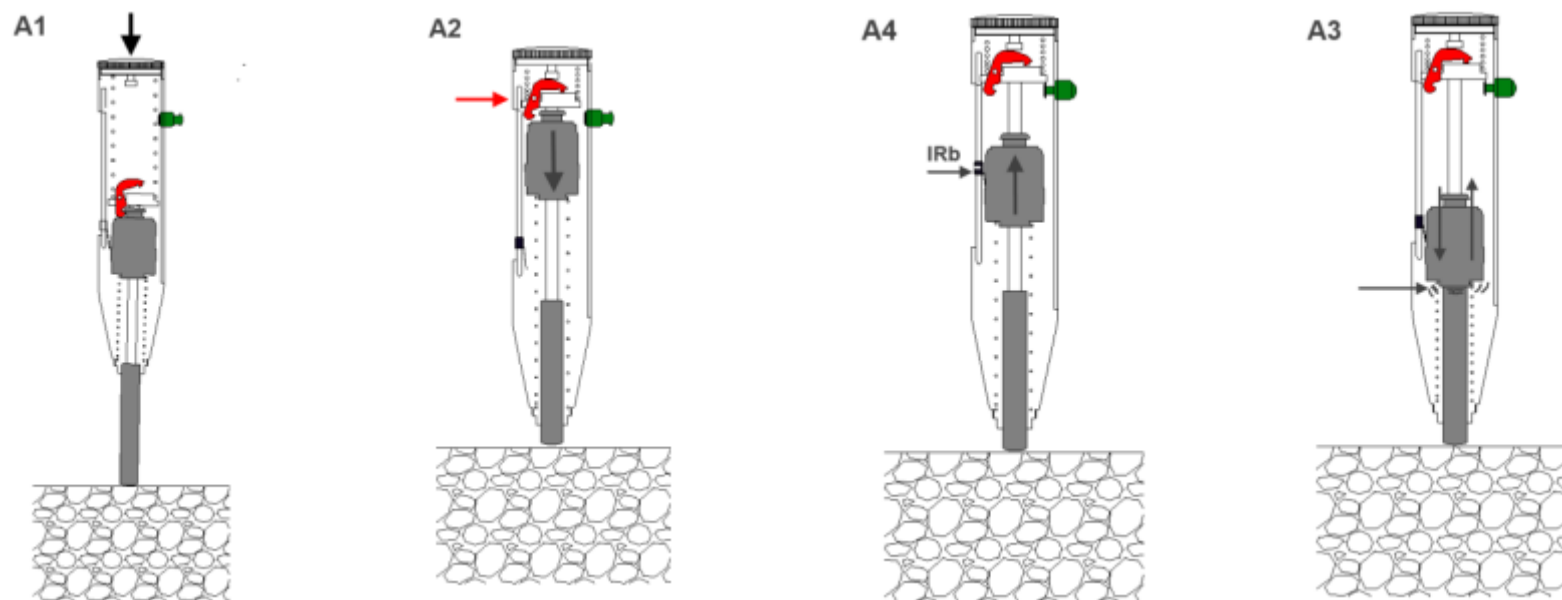
- ▶ • Percussion beam [01]
- ▶ • Percussion spring [02]
- ▶ • Rod guide [03]
- ▶ • Hammer [04]
- ▶ • Bottom [05]
- ▶ • Cursor Index [06]
- ▶ • Hook [07]
- ▶ • Back spring [08]
- ▶ • Limit [09]
- ▶ • Aluminium guide shell [10]

The equipment is constituted by a mobile mass with a certain initial energy, which strikes the surface of a concrete mass. There is a redistribution of the initial kinetic energy following the strike and namely a part is absorbed by the concrete in the form of plastic or permanent deformation energy and another part of the energy is returned to the mobile mass which bounces for a tract in proportion to the remaining energy.

An essential condition for the distribution of such energy is that the concrete mass is practically in infinite relationship with the mass of the mobile equipment, otherwise a part of the initial energy, being independent from the relative masses of the two bodies that will collide, would be transferred to the concrete in the form of kinetic energy.

The condition for infinite mass for the concrete is realized by using very small impact masses. In order to obtain the necessary energy for the impact a spring system is used. The bounce run is determined by the energy of the bounce following the strike with the concrete and by the characteristics of the spring system.

How it works: step by step



All the test devices that are based on the use of the results from the impact energy, must be equipped with a [calibration](#) control in that, after prolonged use, the springs modify their elastic constants. The concrete test hammer ECTHA PRO as ECTHA 1000 has an impact energy of 2.207 N/m.

Different types and forms of sclerometers for the control of various classes of resistance and types of concrete are commercially available. Each type and shape of concrete test hammer should only be used for the resistance class and concrete type for which it was intended and designed.

The [regression curves](#) are applicable only to the ECTHA PRO and [ECTHA 1000](#) concrete test hammer manufactured by DRC Srl. Consequently, DRC will not guarantee the validity of the regression curves where other types of concrete test hammer are employed.

6.6 Performing test

Concrete test hammer TEST

Below are the general procedures for the proper execution of the survey with the concrete test hammer.
Steps to follow:

- ▶ [Calibration check](#)
- ▶ Selection and preparation of the test surface
- ▶ Performing test
- ▶ Test result
- ▶ Report

to get more info, see [video clip instruction](#)

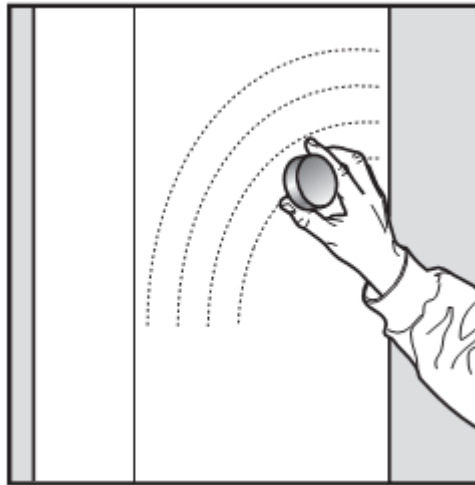
Selection and preparation of the test surface

The concrete elements to be subjected to the test must be at least 100mm in thickness and fixed inside a structure. Smaller sample pieces may be subjected to testing as long as these pieces are rigidly supported. Areas that contain the presences of gravel nests, flaking, coarse textures or other porous elements and in the proximity of significant inertia must be avoided. It should also be avoided, by performing a preliminary [Rebar Locator investigation](#), the carrying out of sclerometric strikes in areas of passing armatures and in the vicinity of pre-compression cables and wires.

In the selection of an area to be subjected to the test the following factors should be considered:

- ▶ Identification of the areas interested in the passage of armatures;
- ▶ Type of surface
- ▶ Status of the surface humidity
- ▶ Carbonatation of concrete
- ▶ Movement of the concrete during the test
- ▶ Evaluation of the damage level of the surface subject to the test
- ▶ Test direction
- ▶ Other appropriate factors as, for example, the type of concrete and the declared resistance class

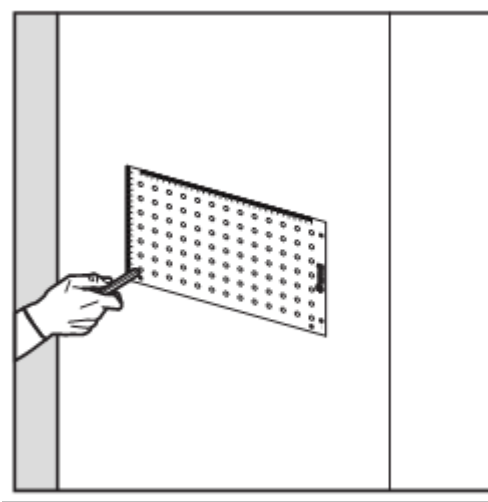
The area to be subjected to the test must be approximately 300 mm x 300 mm. Ensure that the distance between the two points of impact are not less than 25 mm and that neither is less than 25 mm from the edge. The preparation of the test is carried out using an abrasive medium grain carborundum stone, provided with the instrument, to rectify the surfaces with rough or tender textures or surfaces with traces of mortar, in order to render the surfaces smooth.



The smooth or float surfaces may be subjected to testing without rectification. Remove eventual water residue present on the cement surface.

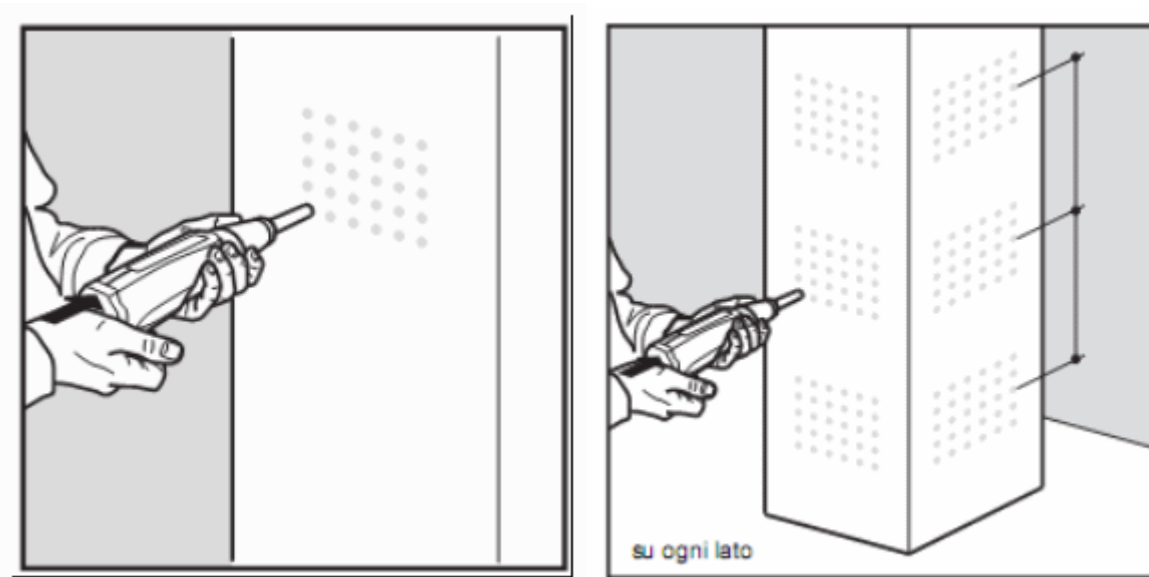
Do a test

Unscrew the safety cap upon removing the sclerometer from its covering, lightly push the percussion rod inwards, compressing it towards a rigid surface. The rod will unhook and exit from the instrument body which is now ready for the test. Operate the instrument at least three times prior to taking any readings, in order to ensure that the mechanics are operating correctly. In order to facilitate the testing an appropriate station-template supplied with the instrument permits the marking of a normal line grid, with lines distancing from 25 to 50 mm and the intersection of the lines as examination points, on the element subject to the test



Depress the percussion rod against the concrete surface under examination, maintaining the apparatus in perpendicular to the surface. Apply gradual to increasing pressure until the hammer unhooks. Maintain the apparatus firmly pressed against the examined surface, depress the halt pawl and read the value of the bounce index. Do not touch the halt bottom while pressing the percussion rod.

Prior to carrying out a sequence of tests it is best to perform a concrete test hammer calibration using the stainless steel anvil of reference and check that it conforms to the limits recommended by the manufacturer (the average bounce index of the concrete test hammer strikes performed with the ECTHA PLUS PRO and ECTHA 1000 to the calibration anvil must be 80 ± 2). On the contrary contact the DRC Srl assistance laboratories. The concrete test hammer should be used at a temperature between 10°C to 35°C . After the impact record the concrete test hammer rebound value



Employ a minimum of nine measures in order to obtain a reliable estimate of the sclerometric index of a test area. Record the position and the orientation of the sclerometer for each measurement. Examine all the prints left on the surface after the impact and if the impact has shattered or perforated due to a gap near the surface, discard the result.

After the tests, re-perform the sclerometer calibration check using the stainless steel anvil. If the result does not conform to the limits recommended by the manufacturer, annul the test and contact the DRC assistance laboratories. Humidity, carbonatization alterations, chemical aggressions, micro-cracks, composition and history of the concrete, status of the scabrous surface and underlying mass object of the percussion, are all elements that influence the bounce index value.

[Calibration check](#) have to be done before and after to perform each test

A correctly proportioned concrete presents a highly alkaline (pH13) environment which inhibits the oxidization reactions of the armature. The concrete is however permeable therefore the carbon dioxide may distribute within reacting with the substances that it encounters giving way to the phenomenon of carbonatization (environment pH9) and to dimensional variations that determine the concrete cracks. The cracking sustains the penetration of both carbon dioxide and water vapor which in turn triggers another process: the oxidization of the armature bars/rods, with notable effects.

The concrete altered by the carbonatization will cause an over-estimation of the resistance which in extreme cases may reach 50% (in effect the formation of calcium

carbonate provokes a hardening of the surface strata). The presence of the carbonatization may be ascertained via a colorimetric test. The test is normally carried out by spraying (using a sprinkler) on the lateral surface of the cylindrical micro-samples, extracted via coring the elements subject to the test, with a phenolphthalein solution at 1% of ethyl alcohol (supplied with the instrument). The solution undergoes a color change once it is sprinkled going from a transparent white to a red-violet color when the surface results as not carbonated; On the contrary where a surface is carbonated the solution does not change remaining its transparent white color. It is possible to establish a correction factor of the readings obtained take into consideration the carbonatization phenomenon by comparing the sclerometric test results carried out on both the carbonated surface and non-carbonated below surface area.

ECTHA PLUS PRO instrument include a [Carbonation test package](#)

Test result

If over 20% of all the measures fluctuates from the average by more than 6 units, the entire set of measurements taken will have to be discarded [following EN 12504-2 standards]

Report

The test report should include the following:

1. identification of the element / concrete structure
2. position of the test area/s
3. concrete test hammer identification;
4. description of the test area/s preparation;
5. concrete details and conditions;
6. date and hour of the test run;
7. test result (average value) and orientation of the sclerometer for each test area;
8. eventual deviations from the standardized test method;
9. declaration of the person responsible for the test, whom can attest that the 12504-2:2001 test has been performed, excepting that referred to in point (8).

Where necessary, the report may also include the single concrete test hammer readings download [ECTHA W](#) free software to make a right report

6.7 Turn ON-OFF

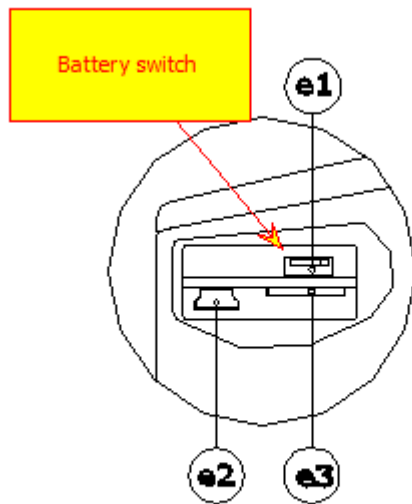
Turn ON - OFF battery

The instrument ECTHA Pro is made with a manual system that allows you to connect and disconnect the batteries (mechanically) from the instrument. Switch is located under the cap USB interface and SD card ("e1")

With this option, you can safeguard your life and the "life" of the battery.

It is advisable to disconnect the batteries for occasional use of the instrument.

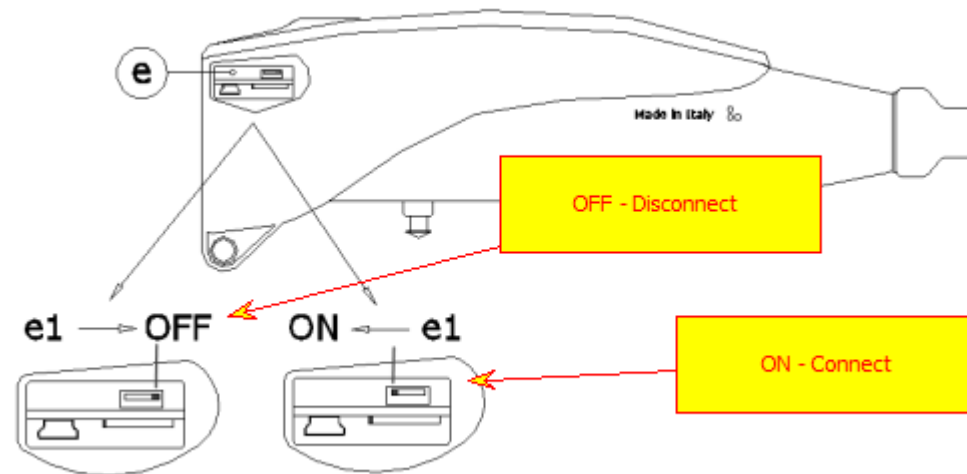
This makes it possible to prevent damage to the battery (under the memory level) and reduce those situations that you are not professional on-site with the instrument completely discharged.



Battery connection

Remove the cap side of the instrument and position switch towards the back of the instrument.

- ▶ ON : Switch positioned on the left of the screen
- ▶ OFF : Switch positioned on the right of the screen



Connecting the batteries, if not appear any writing on the display to put the instrument on charge by connecting the charger provided with the instrument.

- ▶ **We recommend that you disconnect the batteries at the end of each day's work. This procedure does not allow the batteries to degrade rapidly.**
- ▶ **The operation of mechanical disconnection of the batteries means that all the parameters and settings can be lost. Next time you turn the instrument will need to set the date and time.**

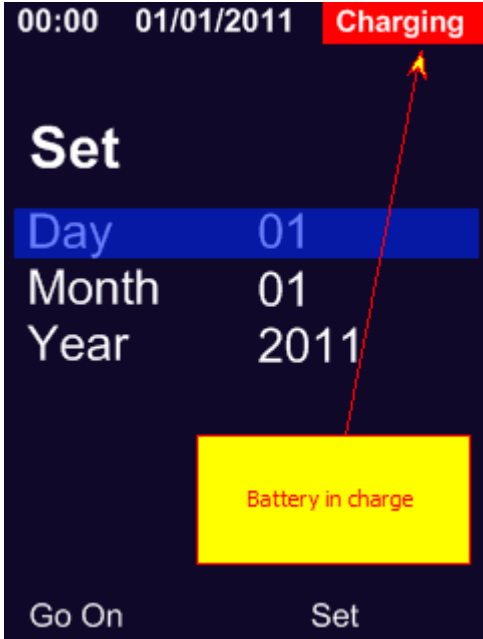
Recharge battery

Connect the USB cable supplied with the instrument in the Mini USB connector located under the cap interface ["E"](#);

- ▶ Connecting the USB cable to the PC or notebook

- ▶ On the battery charger
- ▶ On the external USB battery

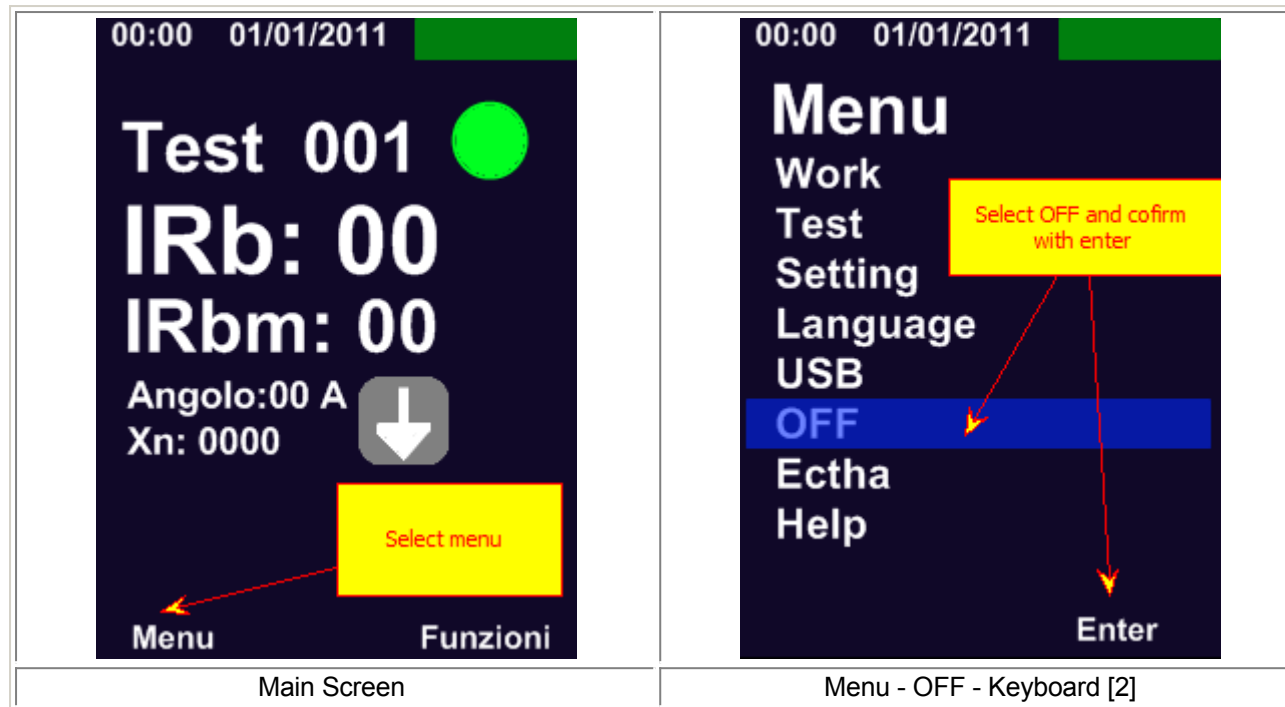
Recharging the batteries takes place whether they are related or are disconnected.
Related batteries, the display shows "Charging" in red until it reaches the maximum charge.

	<ul style="list-style-type: none">▶ Battery charger icon appear on the top▶ Date and time could be set later.	

Turn OFF the instrument

The concrete test hammer **ECTHA Plus Pro** can be turned off through a menu function described below or in the case of non-scheduled use of the instrument for a long period, we recommend disconnecting the batteries as indicated in the battery connection point

From the main screen, press MENU, then select the function OFF and confirm with the select command.



To turn the instrument on hold for a few seconds, the [\[1\] ON-OFF Keyboard](#)

6.8 Record data

Record the data

The hammer ECTHA Pro allows you to carry out the measurement of the rebound in three different settings. The hammer can operate as a simple mechanical hammer with data display in the display, TEST function allows you to record the data and JOB feature that allows you to record and schedule the job.

- ▶ Viewing Mode
- ▶ TEST mode

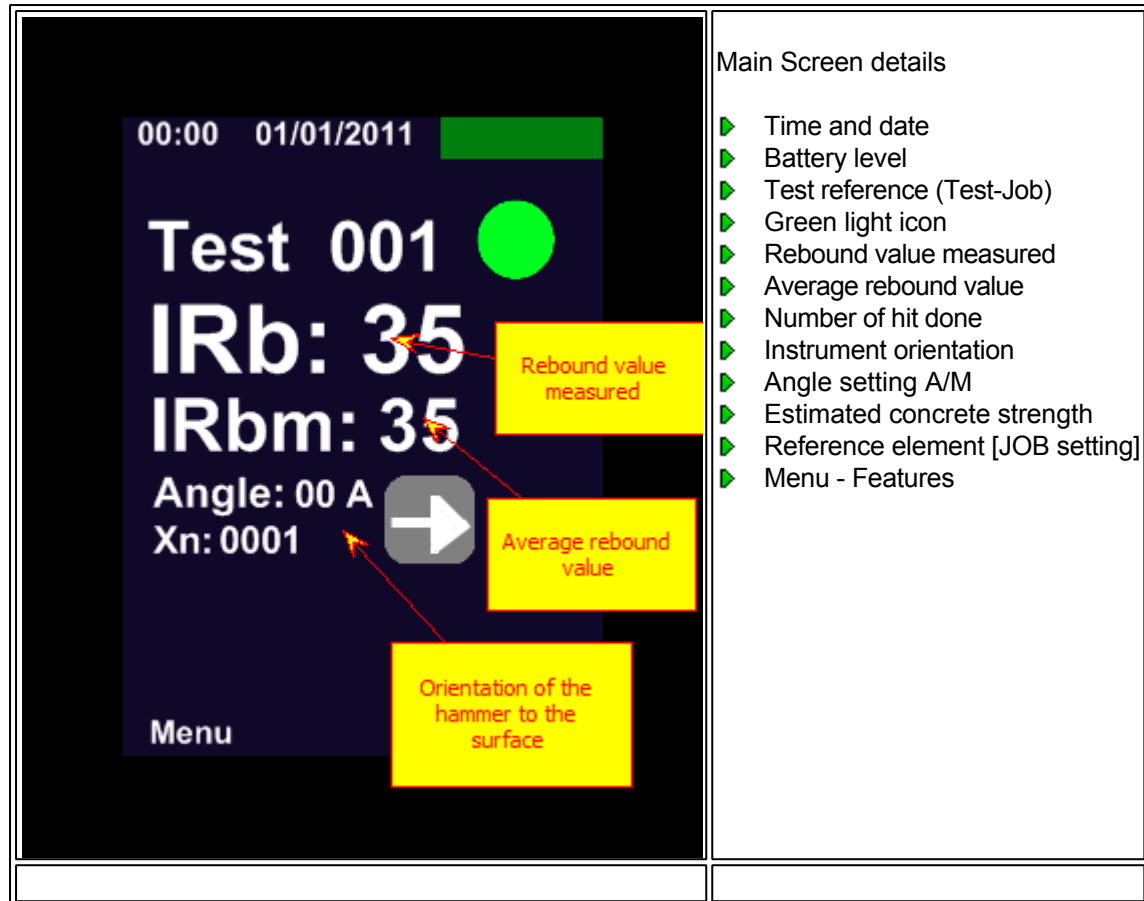
▶ WORK mode

Before you start to use the hammer ECTHA Pro you need to do some work to verify the correct operation of the instrument. The monitoring operations are aimed at mechanical verification and calibration verification. The verification of the [calibration](#) must be performed in the appropriate anvil compliant.

Proceed to checkout mechanics of the hammer before using the instrument for a campaign of investigation.

Get a data

Follows the main screen of the concrete test hammer ECTHA PLUS Pro. From this screen is possible to make measurement, edit setting and change features (menu)



Viewing mode

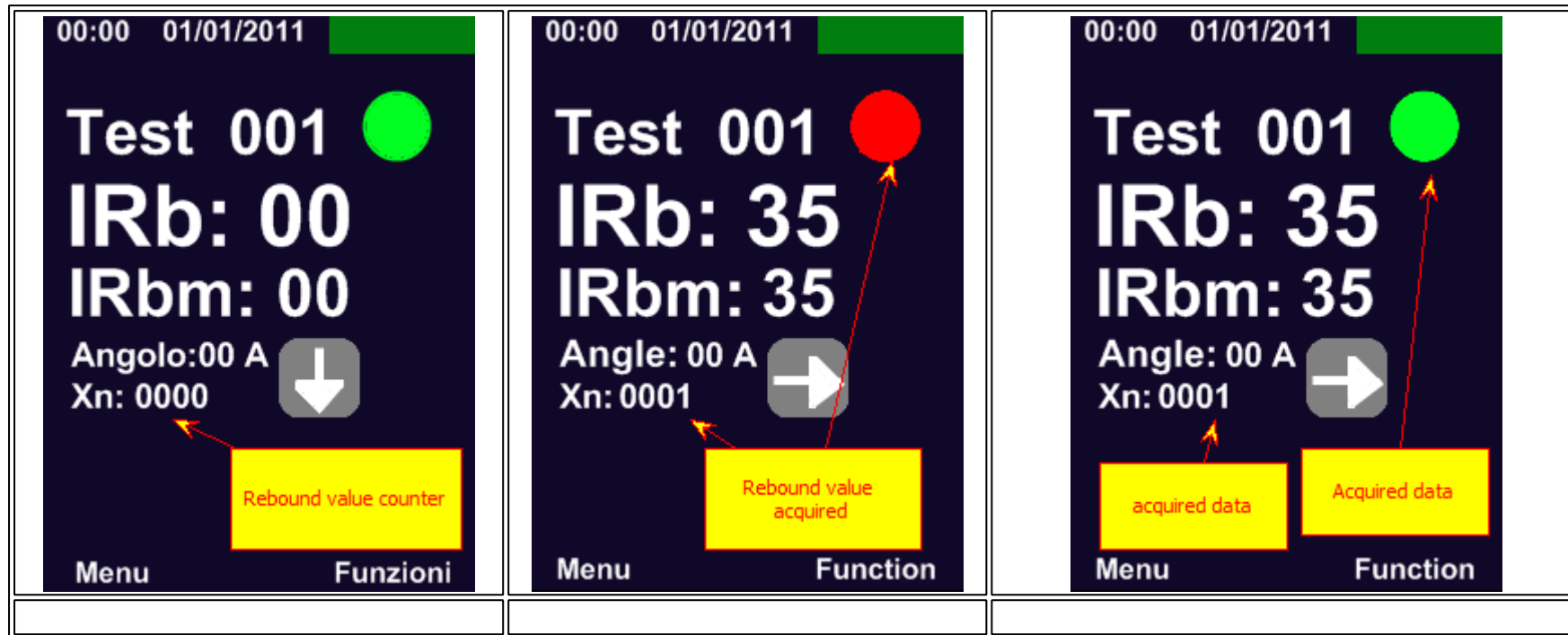
In this mode the hammer operates with a mechanical hammer, the values are displayed in the display without registration or programming.
The information displayed is as follows:

- ▶ Rebound value

- ▶ Average rebound value
- ▶ Hit performed
- ▶ Orientation
- ▶ Angle setting
- ▶ Menu - Features

To get more info about how to performing test see section [Performing test](#)

The sequence of screens will be as follows:



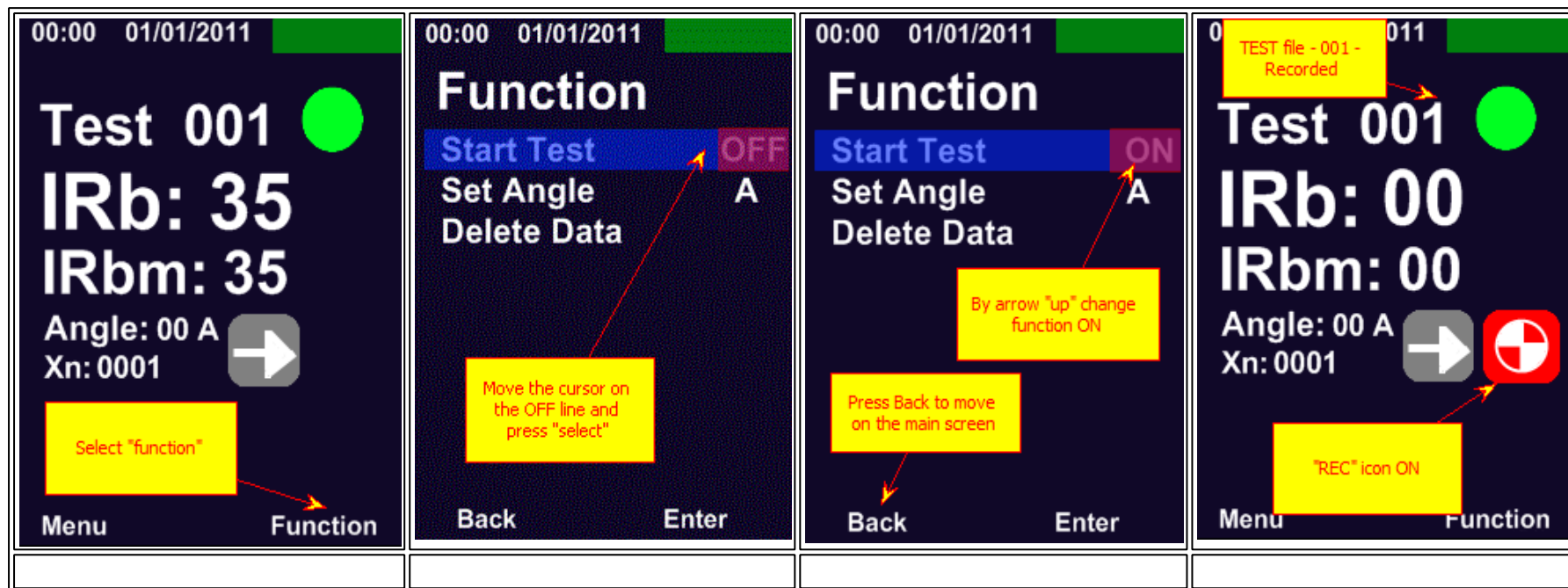
Average of Rebound value - Xn

Value "Xn" and "IRBM"

The average is calculated on the number of beats performed and indicated in the field named **Xn**. Sometimes you get a value of rebound [IRB] does not "conform" because we investigated a test area "deteriorated" or with the presence of inert surface, voids or others reason. In this case it is necessary to "remove" the wrong value from the calculation of the average. Press the command "functions" and delete the value as described in section [Edit Function](#)

Test Mode - TEST 001

Test Mode allows you to record rebound values on site Job . Data will be recorded as .csvs (excel) chart, will be available for post processing analysis at office. The data analysis can be performed with a new software [ECTHA PLUS - W](#)



From the main screen select FUNCTION and through the selection arrow move the cursor on the line ACTIVE TEST. Press the SELECT to activate ACTIVE TEST ON . Press Back to returns to the main workspace. The icon of record confirms the activation of the TEST function and then recording the values

Reverse the procedure by disabling the function TEST - TEST ENABLE OFF to proceed to another registration of a new zone, repeat activation TEST.

The display will show **TEST 002**

WORK Mode - WORK

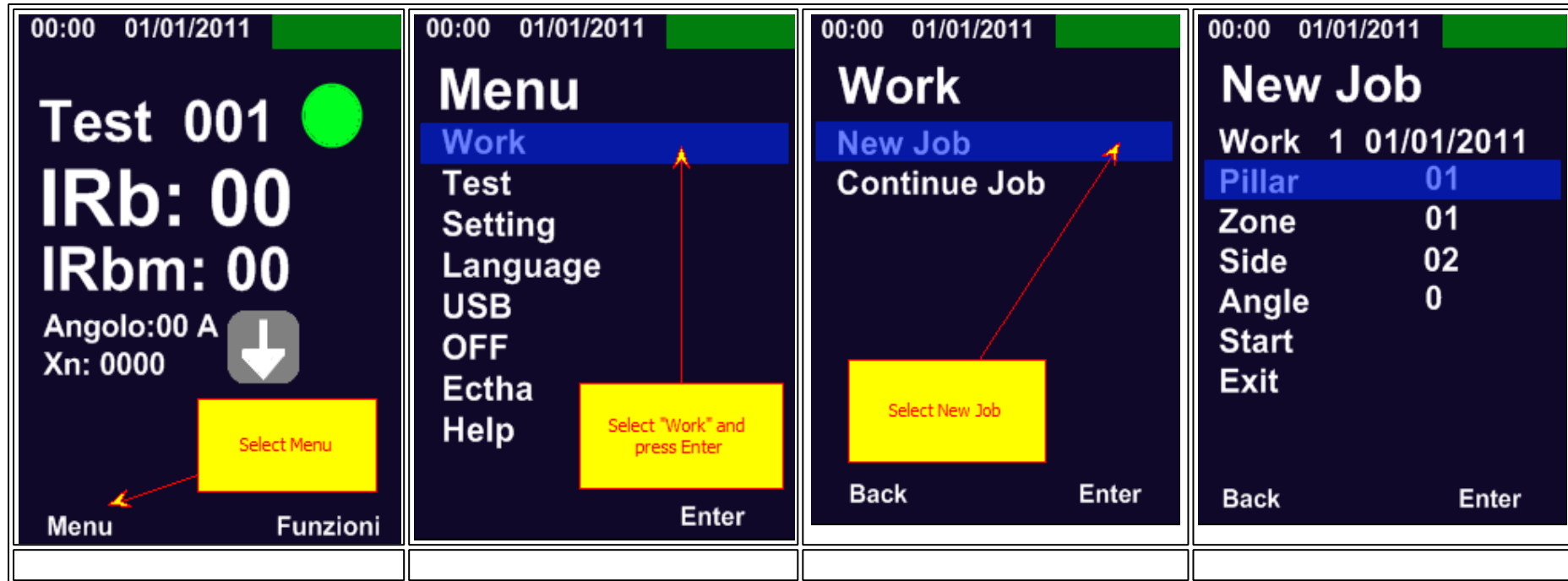
The WORK mode allows you to record the rebound values situ by setting some parameters that facilitate the review the data. It will be possible to set the 'element, the zone, position and other parameters relating to the testing area. Data will be returned in the form of a table. cvs (EXCEL) where they will be given the parameters set in the programming phase. The analysis of data for the preparation of the test report will be made with the use of the software [ECTHA PLUS - W](#)

Ectha Plus Pro allow to:

- ▶ New Job
- ▶ Existing Job

New Job

To start acquisition with JOB Mode, proceed as shown below.



The JOB Mode includes the ability to set the items to be tested

<p>00:00 01/01/2011</p> <p>New Job</p> <p>Work 1 01/01/2011</p> <p>Pillar 01</p> <p>Zone 01</p> <p>Side 02</p> <p>Angle 0</p> <p>Start</p> <p>Exit</p> <p>Back Enter</p>	<ul style="list-style-type: none"> ▶ Work 1 01/01/2011: Files name and date ▶ Pillar 01: Element reference number ▶ Zone 01: Area reference number ▶ Side 01: Face reference number ▶ Angle 00: Angle orientation ▶ Start: start performing test ▶ Exit: project out and save data 	
--	---	--

Setting

Follows the instruction to set or edit JOB parameters

The first four screenshots show the 'New Job' setup process:

- Screenshot 1:** 'Pillar' is highlighted. Instruction: Select "Pillar" Insert referent number Confirm with Enter.
- Screenshot 2:** 'Zone' is highlighted. Instruction: Select Zone Insert reference number confirm with enter.
- Screenshot 3:** 'Side' is highlighted. Instruction: Select face or side inser reference number confirm with enter.
- Screenshot 4:** 'Start' is highlighted. Instruction: Select "start" to perform the test press enter.

The fifth screenshot shows the 'Job' screen with the following fields and instructions:

- Job:** 01
- IRb:** 00
- IRhm:** 00
- Legend:** P = Pillar number, Z = Area number, F = Face number.
- Buttons:** REC icon ON, a right arrow, and a red square with a white circle and cross.
- Parameters:** P: 01 Z: 01 F: 01
- Bottom:** Menu, Function

Legend:

- ▶ JOB number
- ▶ Rebound value IRB
- ▶ Average IRBm
- ▶ Angle : impact orientation
- ▶ Angle Icon
- ▶ REC Icon ON
- ▶ Number of Value recorder
- ▶ Parameter Pillar (P) - Zone (Z) - Face (F)

Angle Setting

In setting page, you can set the correct impact angle [orientation]. Setting could be Manual and / or Automatic.
See procedures in the [setting](#)

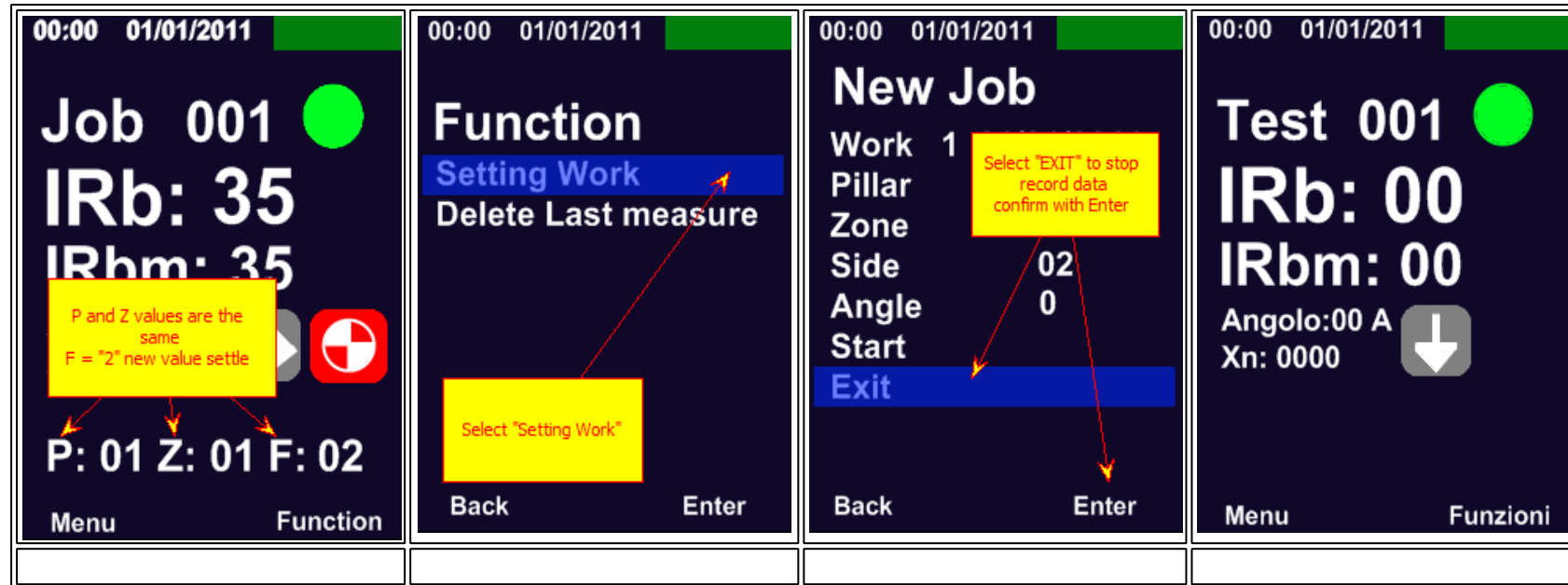
Change Setting

It's possible to change the setting values of work and / or delete the last value acquired in order not to affect the media.



Close project

When the operations of data acquisition is finish, close the work as presented below.



ECTHA PLUS PRO is back to Viewing Mode

Existing Job

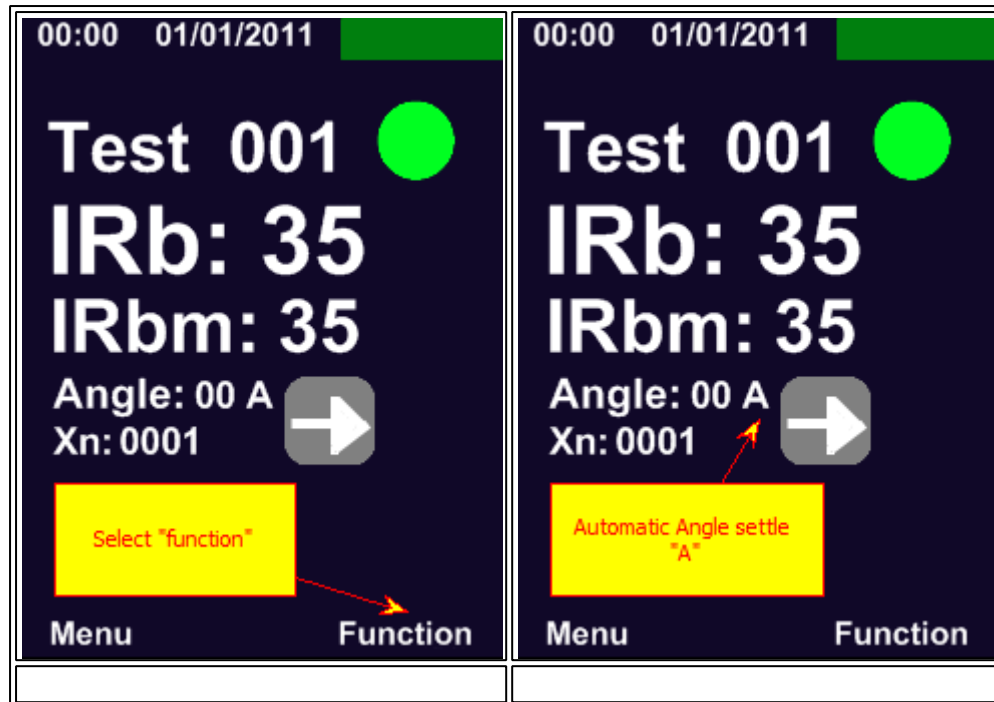
Selecting EXISTING WORK instrument charging a job left unfinished by reactivating all the settings that were previously septeate. The file is re-opened again exactly the position in which it had been closed.



6.9 Edit function

Edit function

FUNCTION in the main screen allows you to perform quick settings or activate TEST mode as described [above](#)



On the "Function" menu follows command are available:

- ▶ **Active Test Mode**
- ▶ **Set Angle (Impact Orientation)**
- ▶ **Erase Data**

Commands Set Angle and Erase Data will be identical to those which we find or in the menu SETTINGS - ANGLE - ERASE Data either on Job Mode

Set Angle

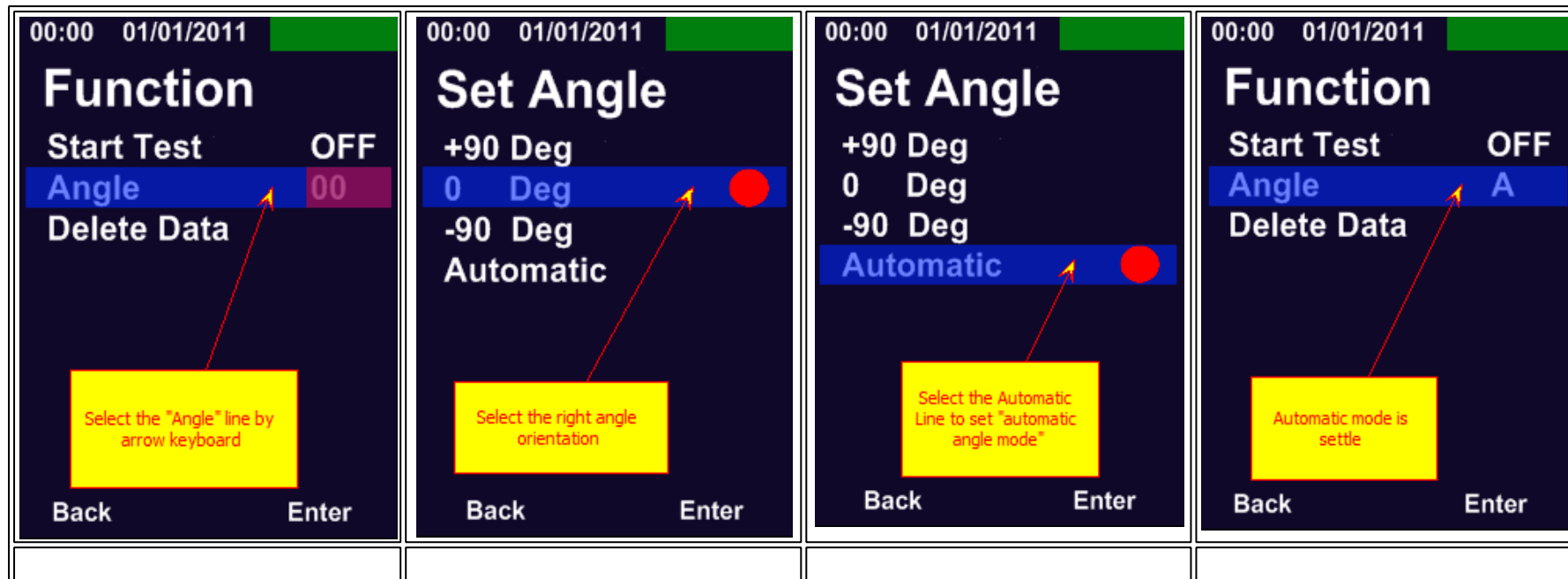
Concret test hammer ECTHA PLUS Pro is equipped with an accelerometer who calculates the orientation impact angle in automatic way. Manual option is available as well.

Set Angle mode to Test Mode or Viewing Mode:

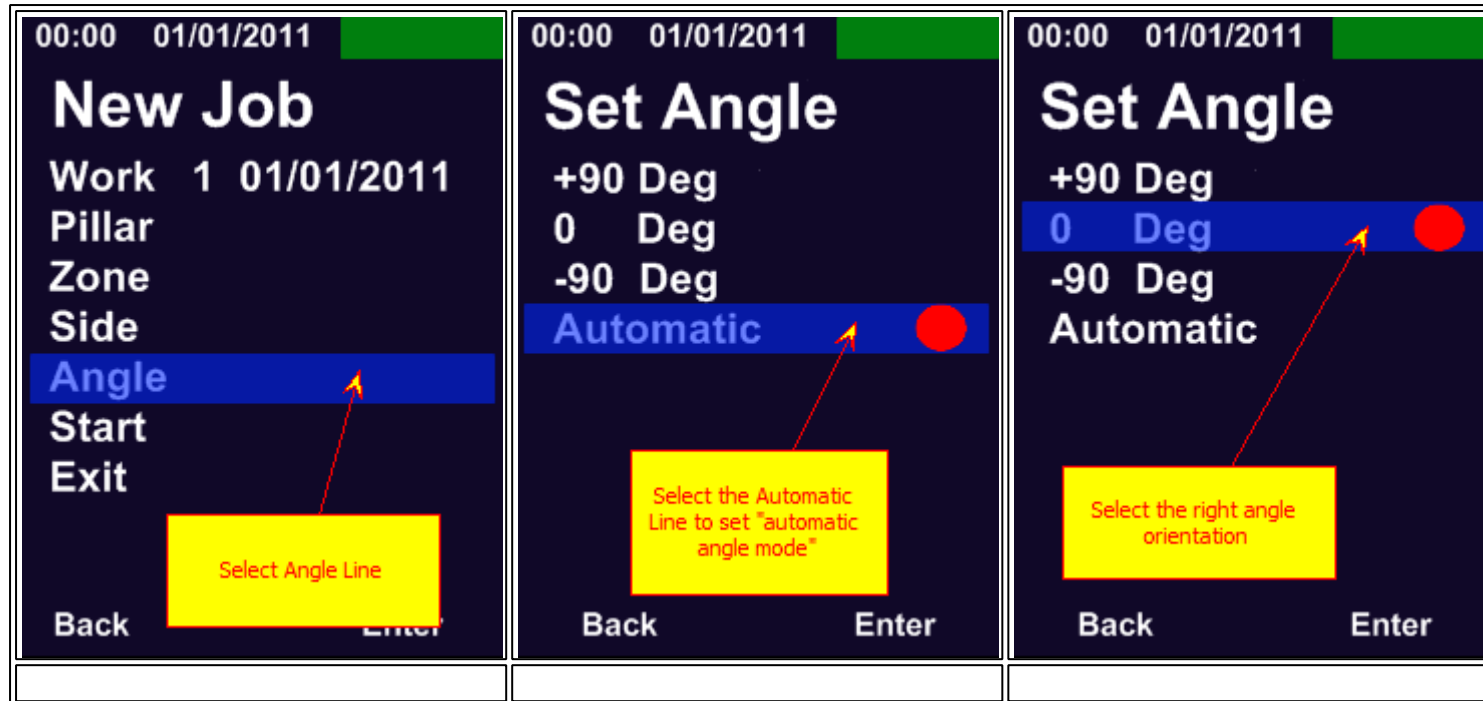
From the main Screen, press the FUNCTION command - move the cursor to the command line SELECT ANGLE (angle set is shown at the time) and confirm with SELECT.

Choose the right angle or [A] as automatic mode.

Test Mode and Viewing Mode



Work Mode



Erase Data

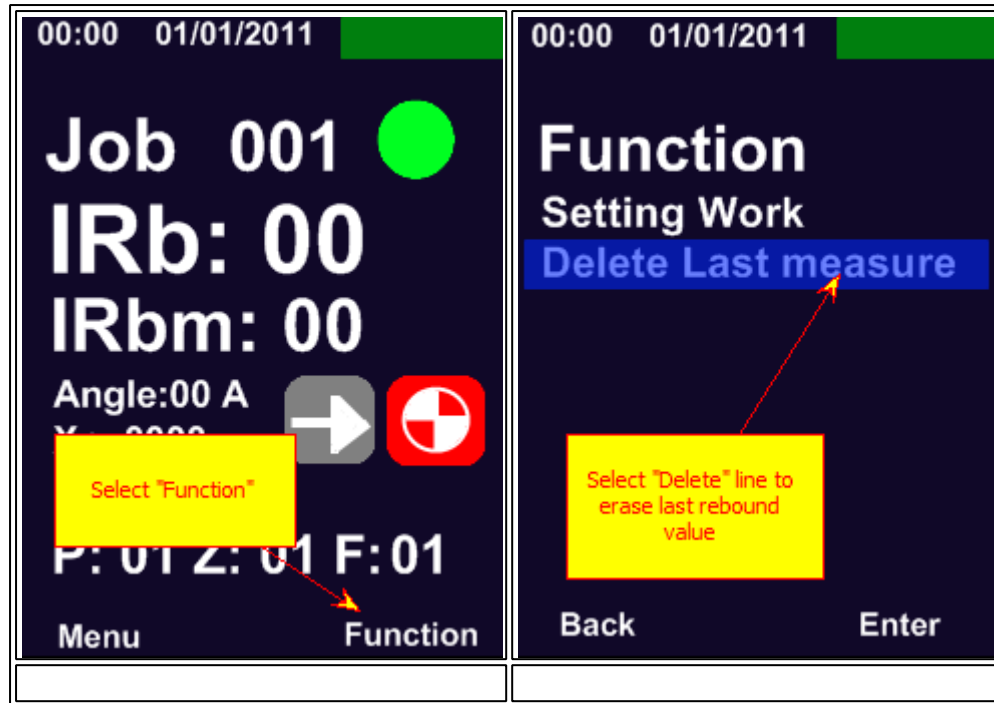
Durante le operazioni di indagine è possibile acquisire un dato di indice di rimbalzo con un valore anomalo causa presenza di nidi di ghiaia, vuoti, inerti superficiali, armature. Tale valore dovrebbe e può essere rimosso dalla media IRbm. Vediamo come procedere per eliminare il valore.

Modalità TEST e VISUALIZZAZIONE



From the main Screen, press the FUNCTION command - move the cursor to the command line DELETE DATA it's showing the last recorded value, press the SELECT command to deletes the last recorded data and returns to work.

Job Mode



6.10 Blue Tooth

Blue Tooth

ECTHA PRO is equipped with [Blue Tooth 4.2](#) for the transmission of data rebound index to the application [ECTHA-R](#). Through this feature you can view real-time rebound index directly on the Android device associated with the instrument.



Blue Tooth is activated automatically when you switch on the ECTHA PRO. Activating the communication system of the device to be associated, this is immediately recognized. The name that appears in the Android device is **ECTHA-PRO** followed by an identification number.

The hammer **ECTHA PRO** once associated with the device set the time and date automatically and so aligned with the device.

Data visualization index rebound in the Android device is only possible with the application [ECTHA-R](#) that must be installed on the Android device.

For further clarification on the operation of [APP-R ECTHA](#) visit the product page

6.11 Menu

Menu

From the Menu page is possible to set, check and adjust all parameters of the instrument. The page menu includes the following commands:

- ▶ [Job](#)
- ▶ [Test](#)
- ▶ Settings
- ▶ Language
- ▶ USB

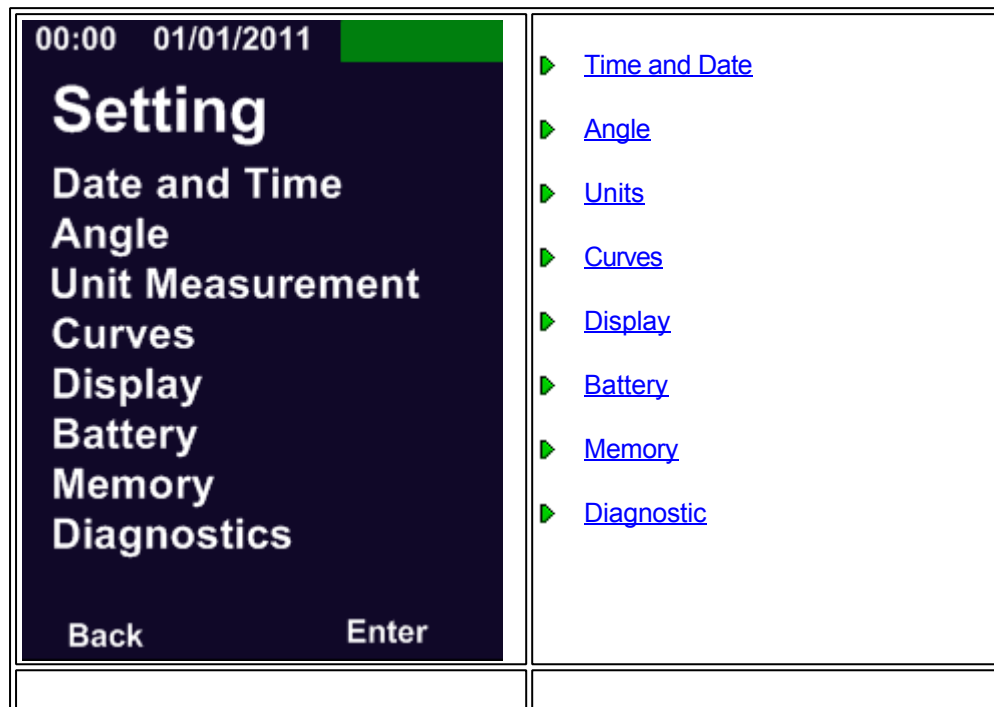
- ▶ OFF
- ▶ ECTHA PLUS PRO

Job and Test mode are two different way to get measurement. See [Record Data page](#)

6.11.1 Setting

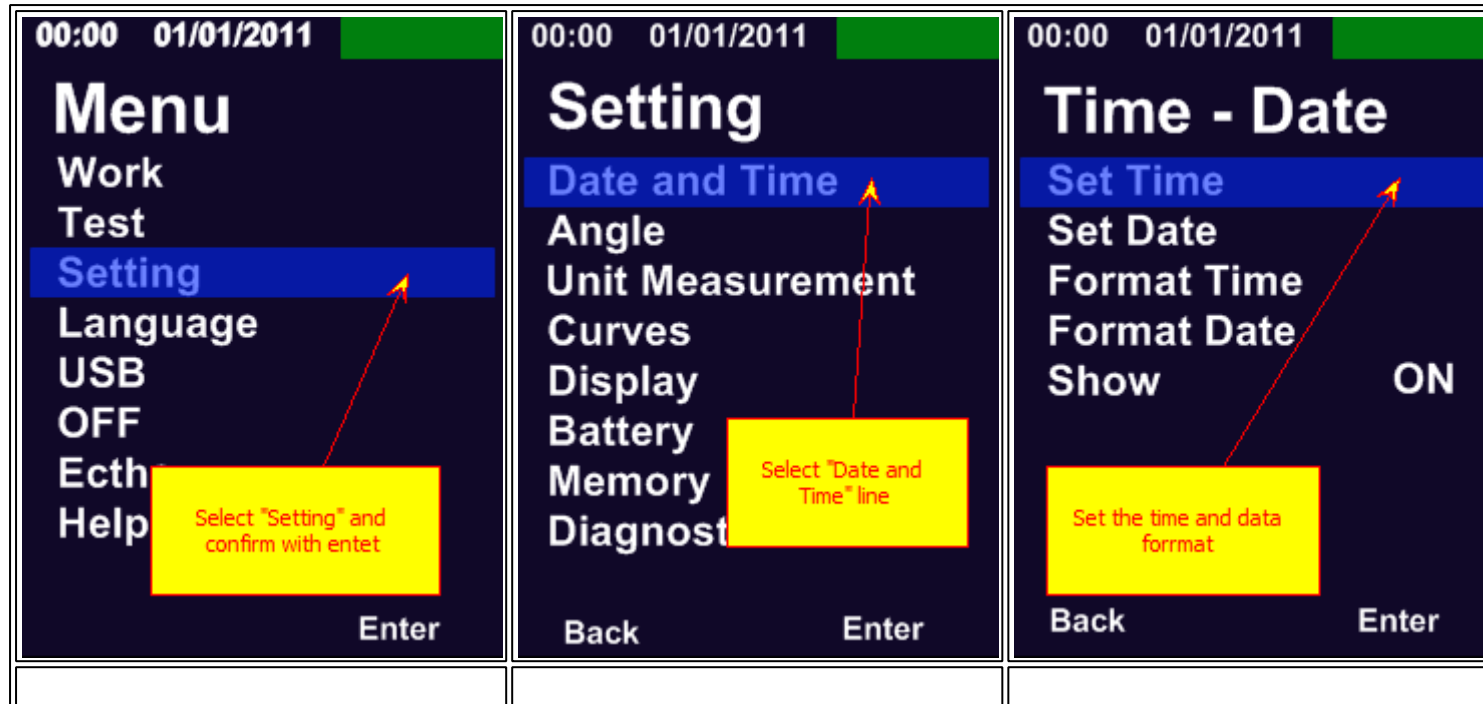
Setting

On the "Setting" page there are a different parameter to set:



Time and Date

In this section you can set the time and configure the time and date format viewing.

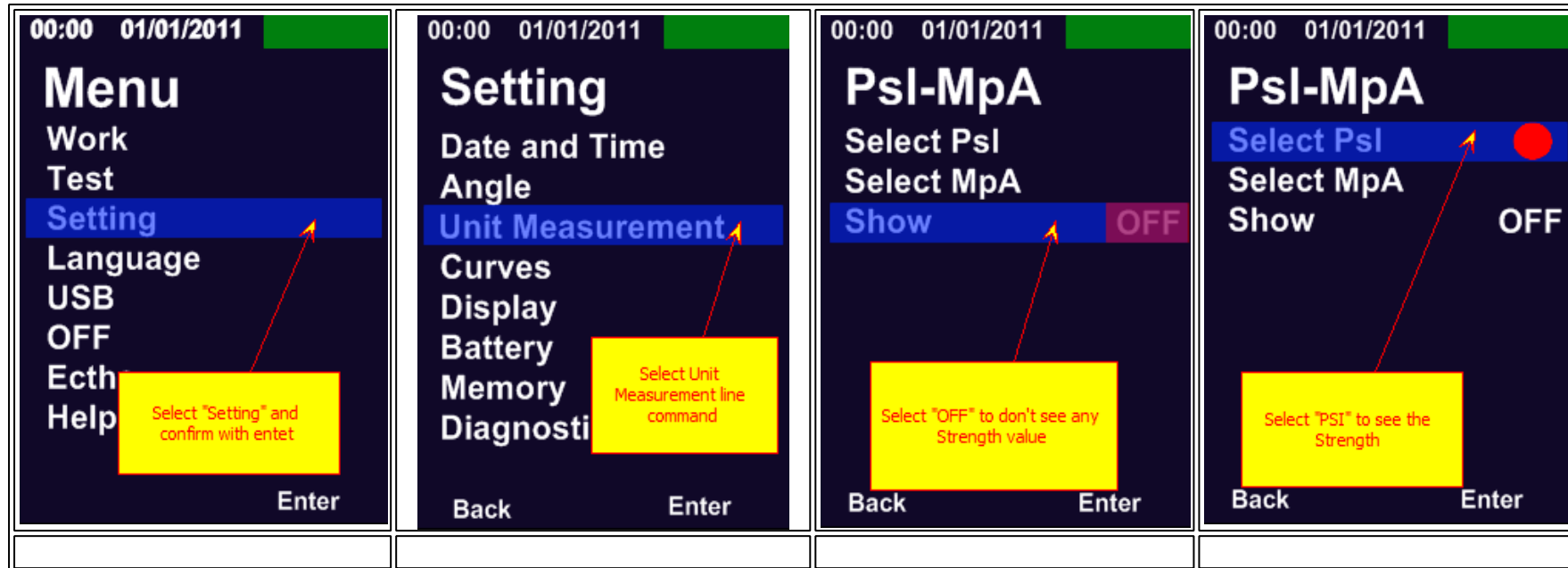


Data Unit format

The Concrete Test Hammer **ECTHA Plus Pro** allows you to display the values of rebound index also in the form of mechanical strength of the material (estimated from the correlation curves loaded into the instrument). The display of resistance values can be:

- ▶ Unit MpA
- ▶ Unit Psi
- ▶ Viewing On-Off

In the default setting the hammer **ECTHA Plus Pro** does not display the value of the mechanical strength of the material. The display mode is set to OFF.



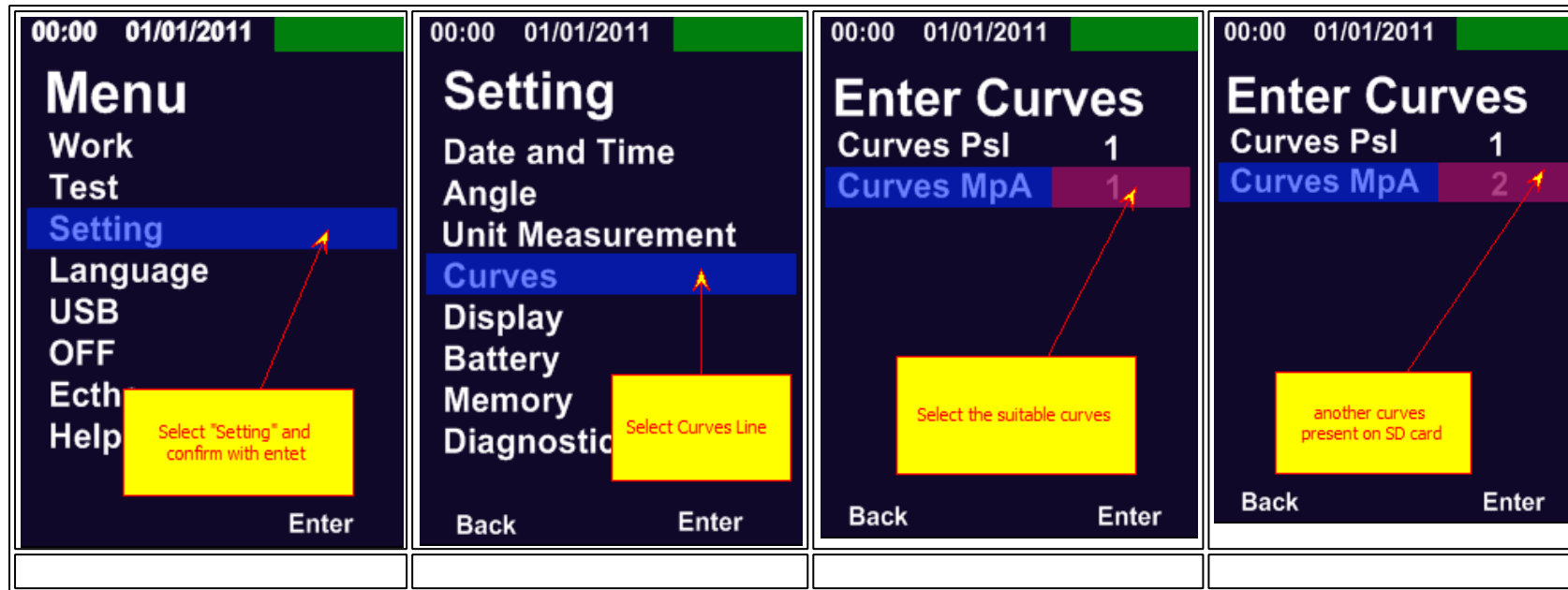
Curves

Concrete Test Hammer **ECTHA PLUS Pro** include correlation curves show rebound value in resistance strength value directly in side Job.

Concrete Test Hammer **ECTHA PLUS Pro** comes with the correlation curves that are the result of research carried out by the DRC in cooperation with Università Politecnica delle Marche - see chapter [Curve Correlation](#) or download documents.

The hammer **ECTHA PIUS Pro** allows you to load on board the correlation curves through its inclusion of an equation that describes the curve. With this function, you can obtain values of mechanical strength of the concrete in place through curves relating to the material under investigation.

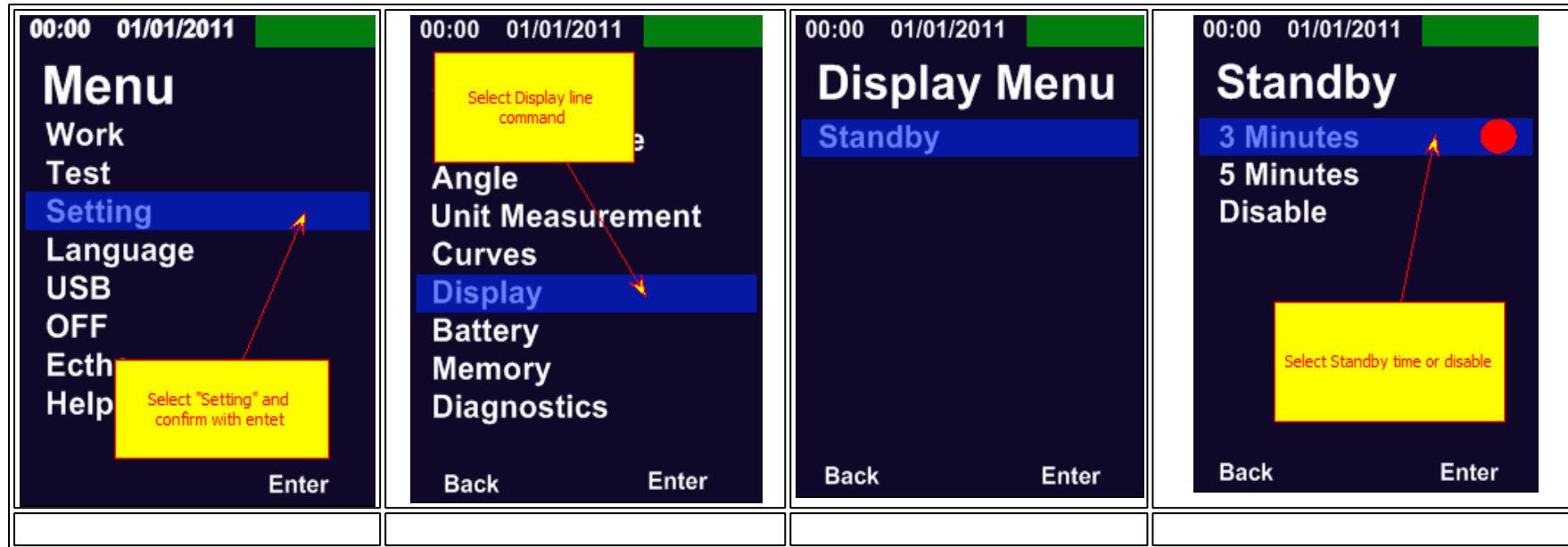
From the main screen, select the command MENU - SETUP - confirm with SELECT, move the cursor to the command line CURVE and confirm with SELECT. Curves must have been previously loaded on the SD card.



We recommend that you do the conversion from the value index rebounded in strength in the office through special software.

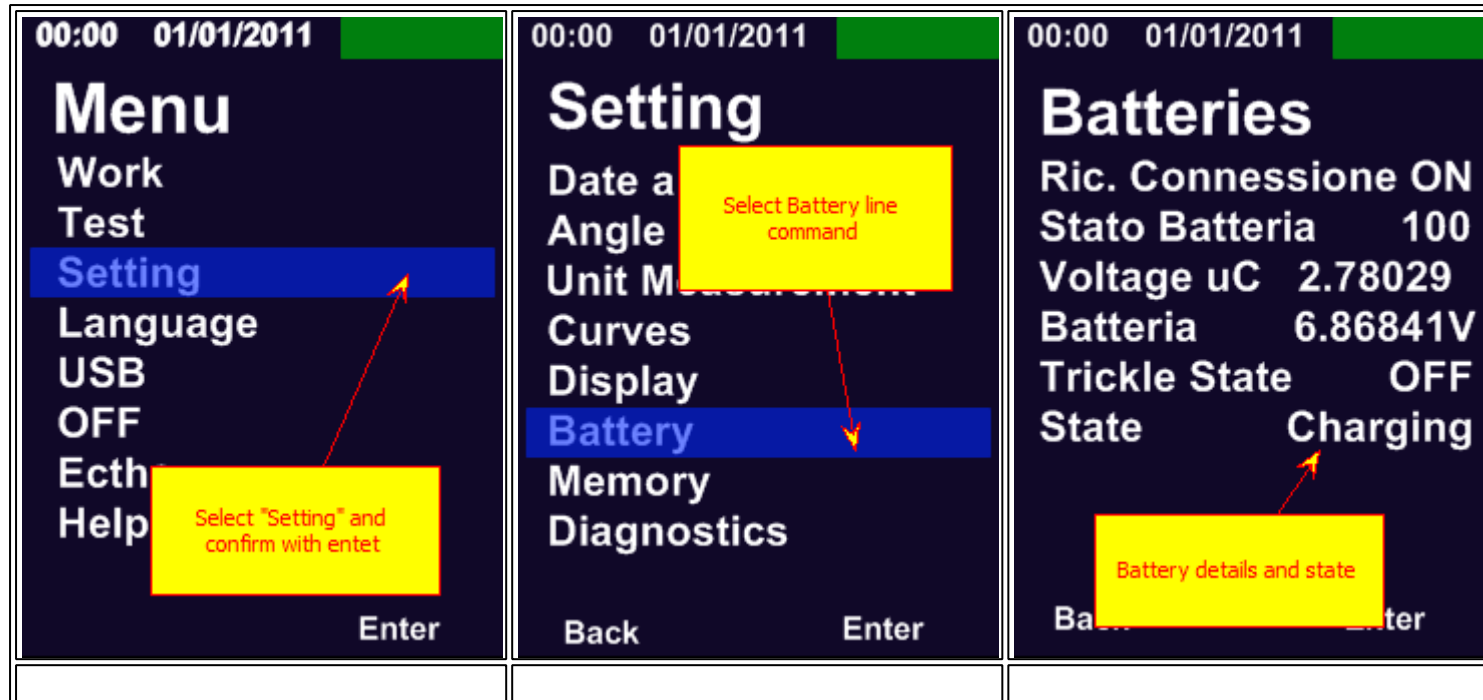
Display

Display function allows you to define the time of standby



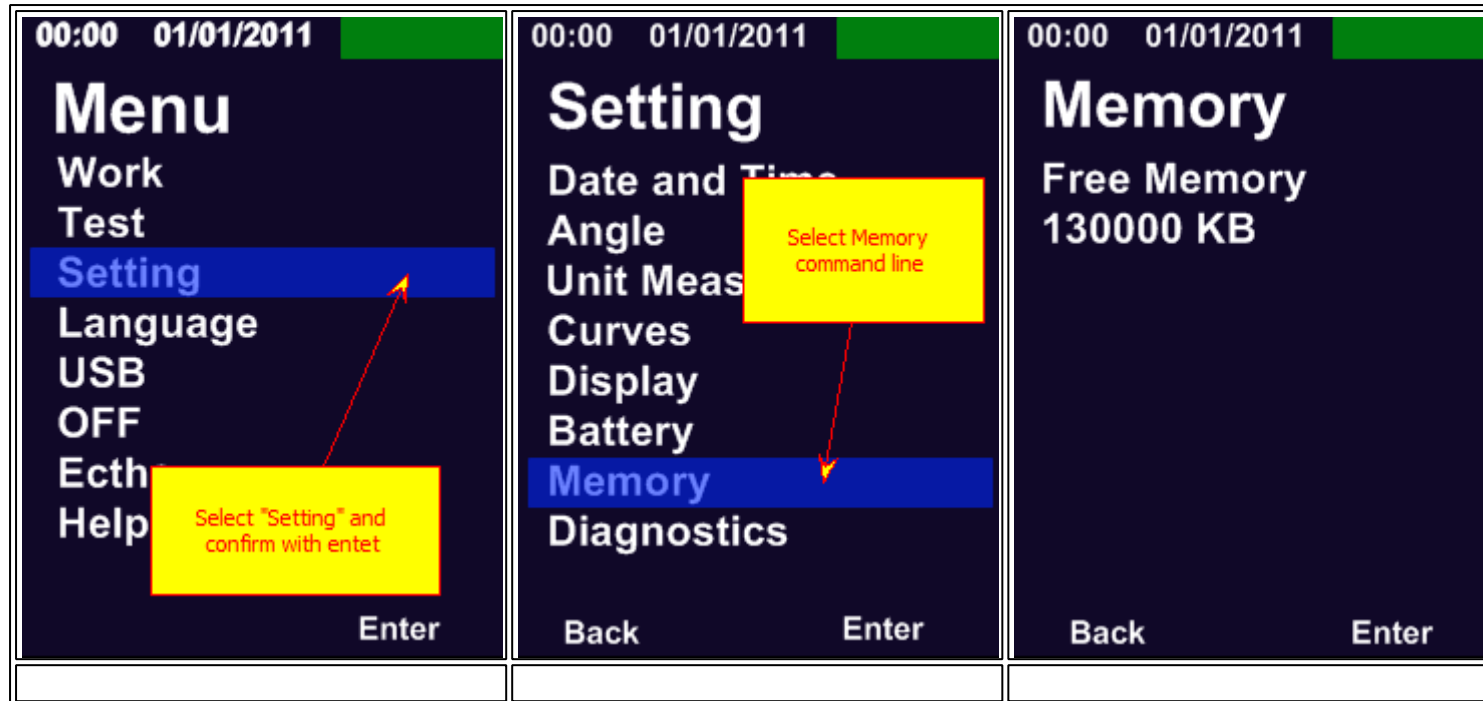
Battery

The battery function provides information on the status of the battery. In case of faults and malfunctions send the information on the page to the service center DRC. It is recommended not to change the parameters on this page unless clear indications received from DRC staff.



Memory

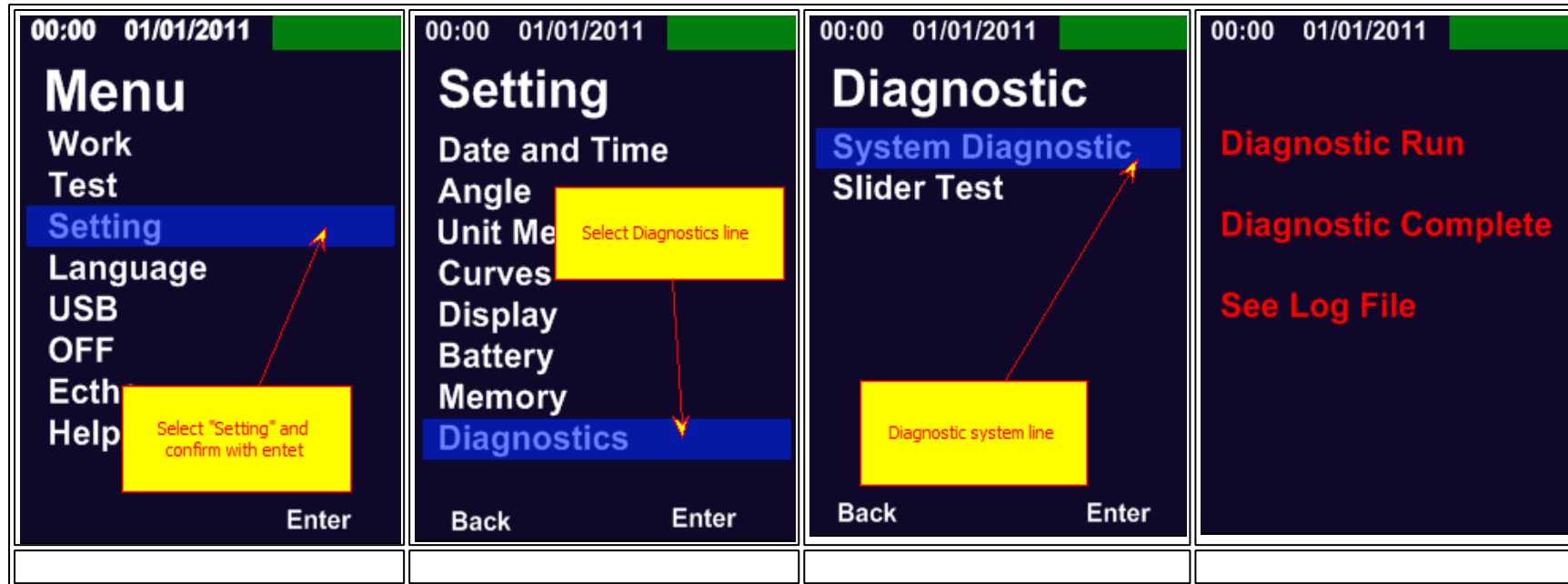
The MEMORY function displays the remaining space on the card MINI SD. MEMORY will appear in the screen space, in KB free.



Diagnostic

This function performs an internal test tool to verify that all functions of the hammer operate properly. The hammer ECTHA PLUS Pro performs a Self Diagnosis recording the results in a txt file. In case of anomalies send the txt file to the service center DRC. The function SLIDER TEST allows to verify the correct operation of the sensor reading. The data displayed is shown in terms of capacity resistive

Auto Test



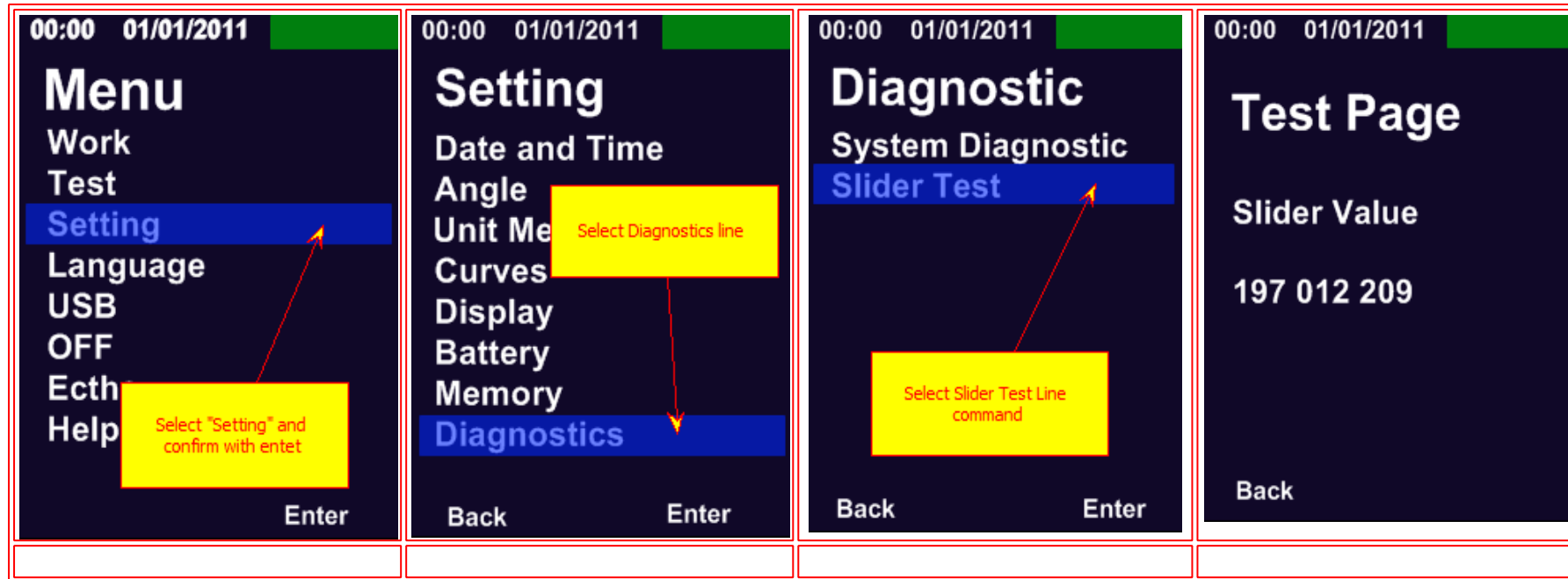
At the end of the diagnostic procedure generates a LOG file that contains information necessary for an initial and rapid assistance.

[The log file](#) is located in the [folder setting](#). See the page

Transmitting the LOG folder to the service center of the DRC

Slider TEST

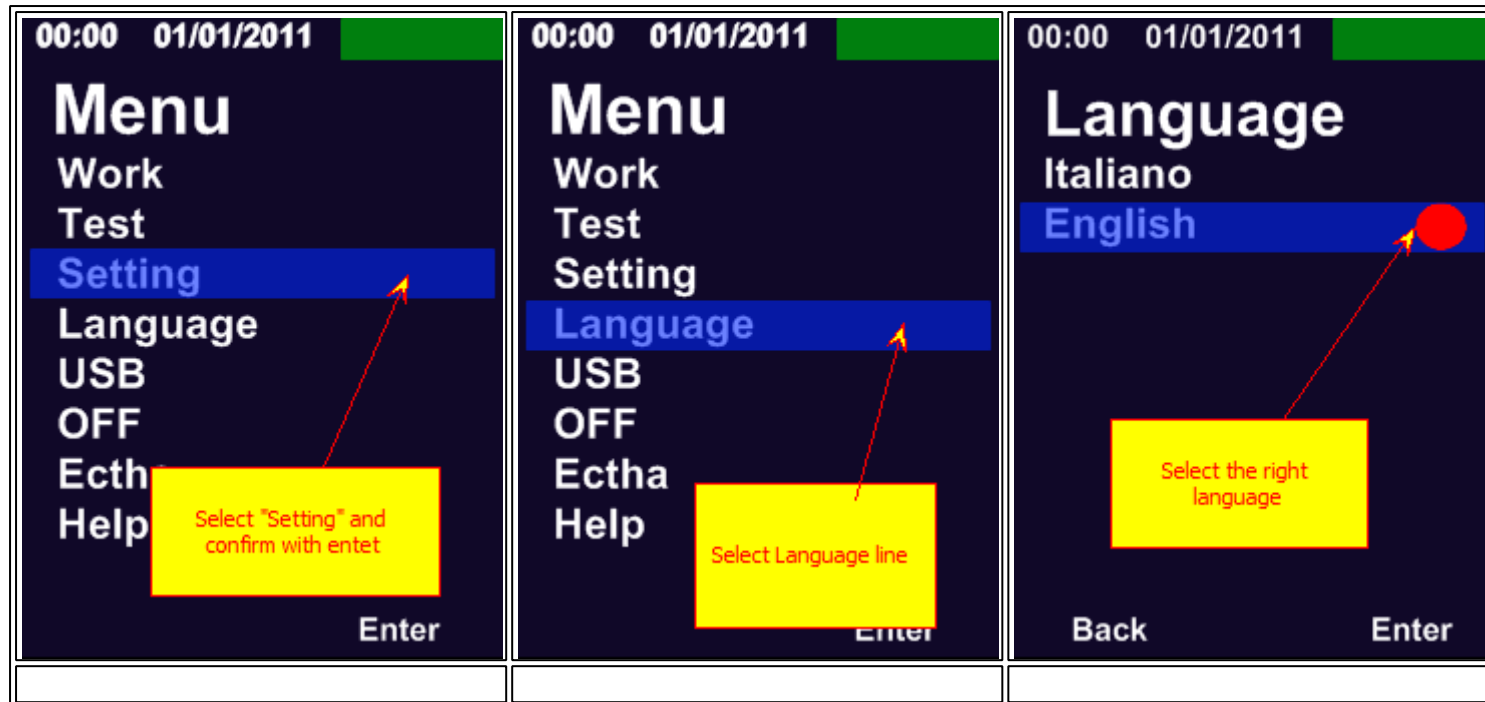
The SLIDER TEST function is reserved for authorized service centers.



6.11.2 Language

Language

It's possible to select the right language menu



6.11.3 USB - SD Card

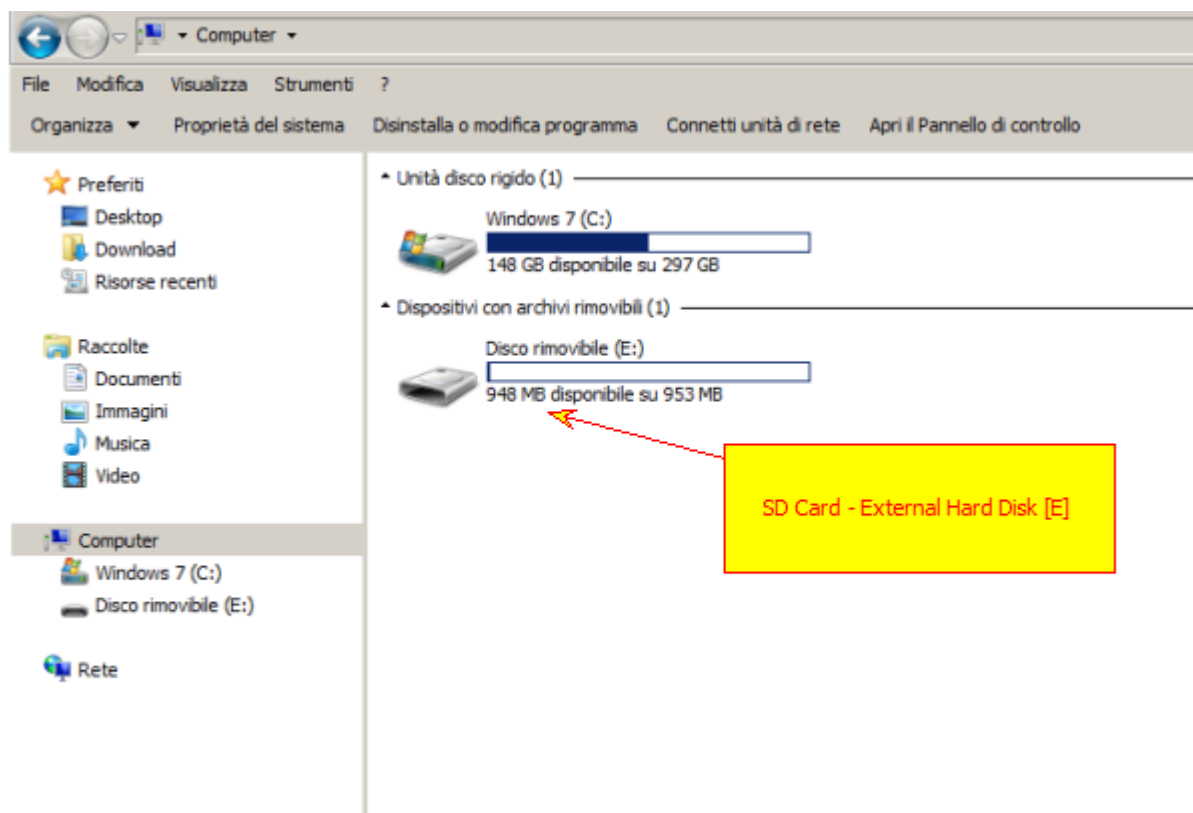
USB - Mini SD Card

Thanks to the Mini USB port on the instrument you can download JOB and TEST data files got in site or upload files setting on the instrument.

Export Data from Ectha Pro

By connecting the hammer to the PC that displays the instrument with a normal memory card.
Proceed as follows:





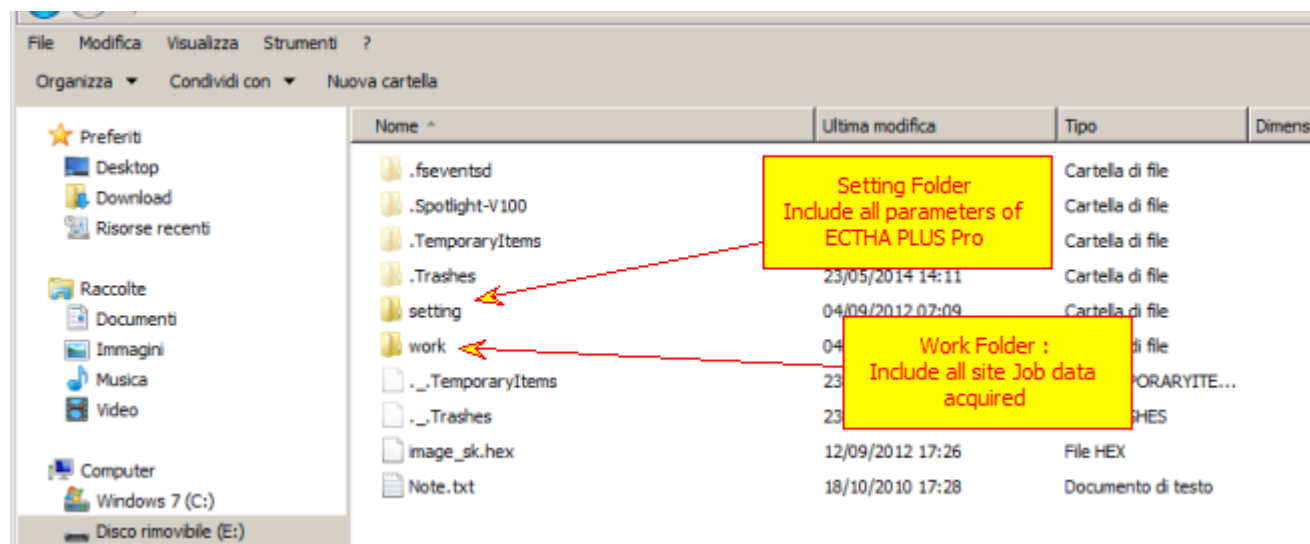
when finished press the Disconnect command.

Mini SD Memory Card

The mini SD card contains:

- ▶ Files of the values acquired - Work
- ▶ Files tool settings - Setting

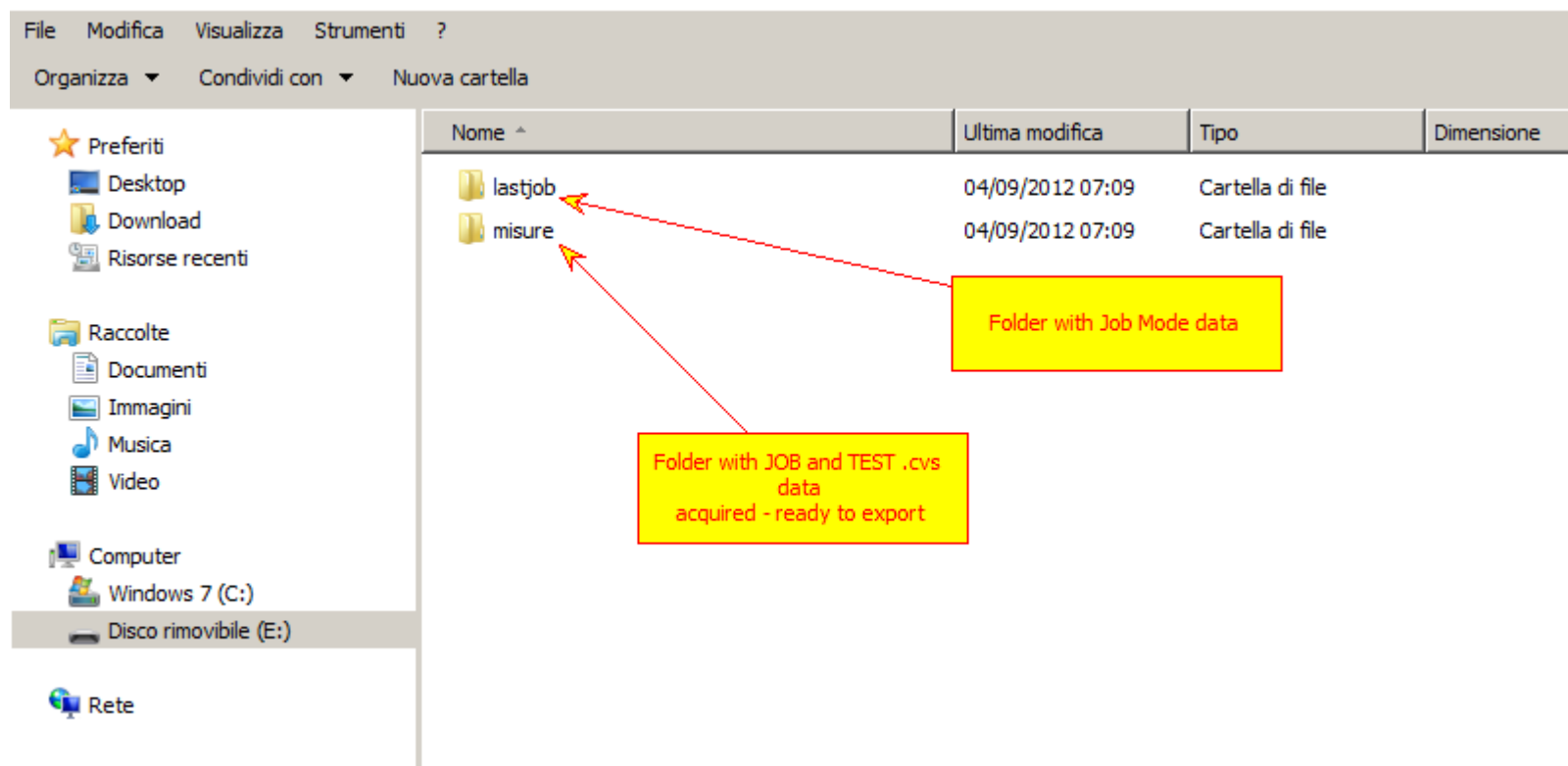
Connect the instrument to the PC and open the memory card as shown above:



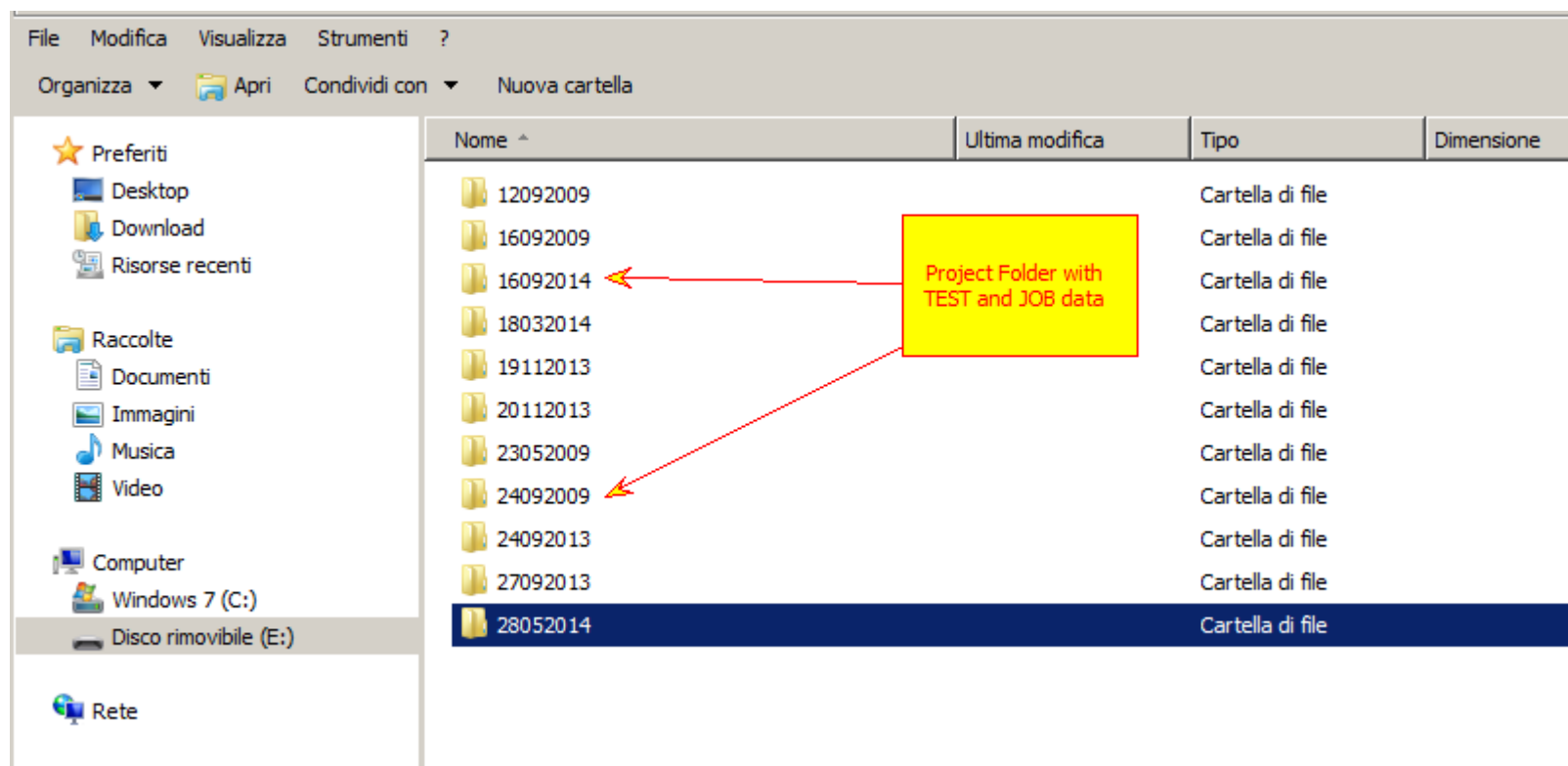
Files are saved in two different folder: Setting and Work

Data Acquired

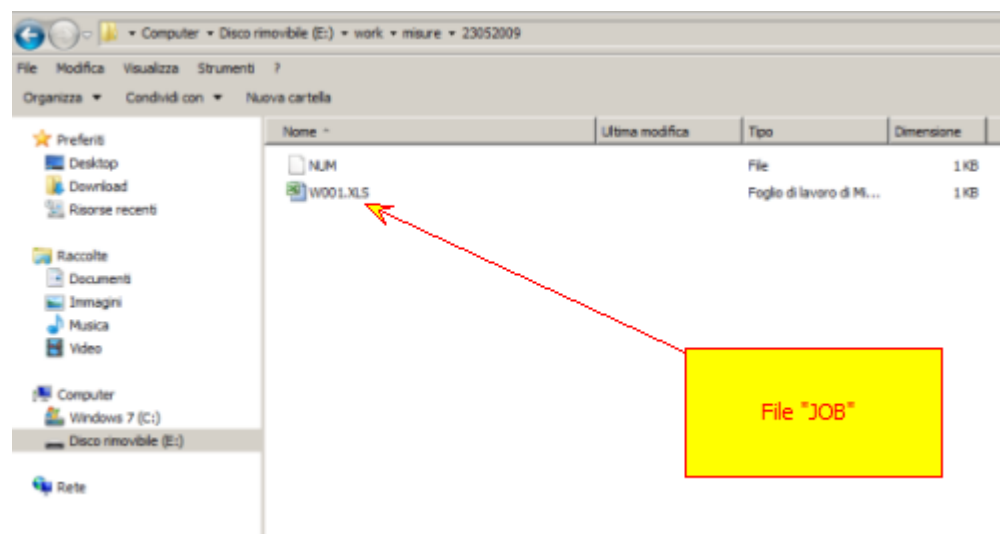
Select "Work" folder



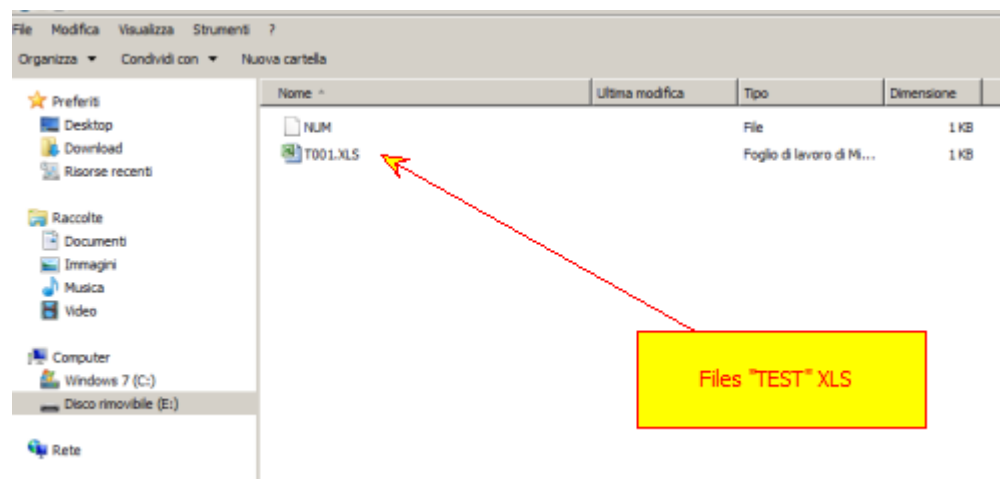
Folder "last Job" include ID number of Job Files acquired.
Select "Misure" folder



Each file data is stored in a folder with ID number is date of the test.
The follows folder could include Test file or Job file.



Job File data .xls

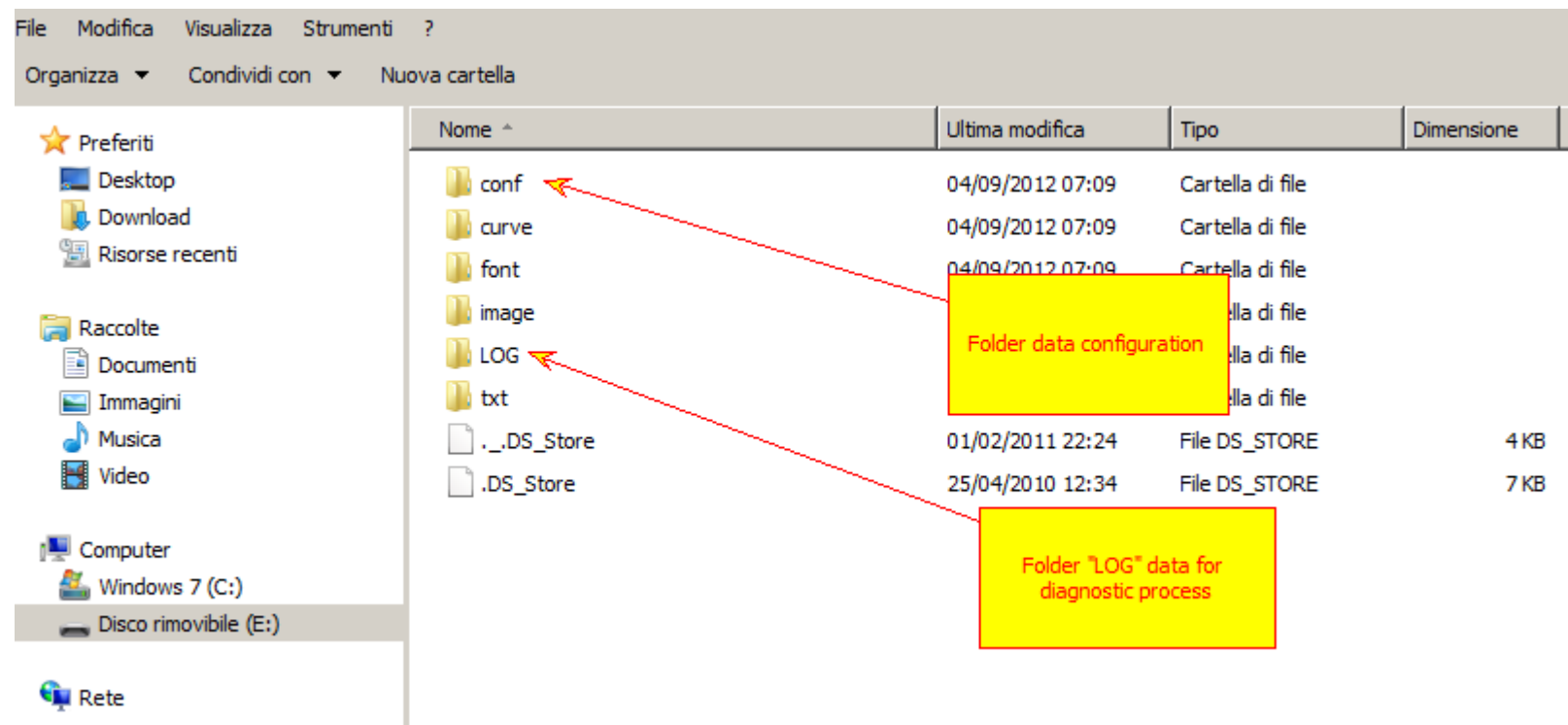


Test file data .xls

The files contain all the values rebound value and the information on the site.
The data can be processed on the worksheet or through the use of software [ECTHA Plus - W.](#)

Setting

Settings folder contains the information about the instrument configuration.
It's possible to change configuration folders data only if authorized by the DRC staff.

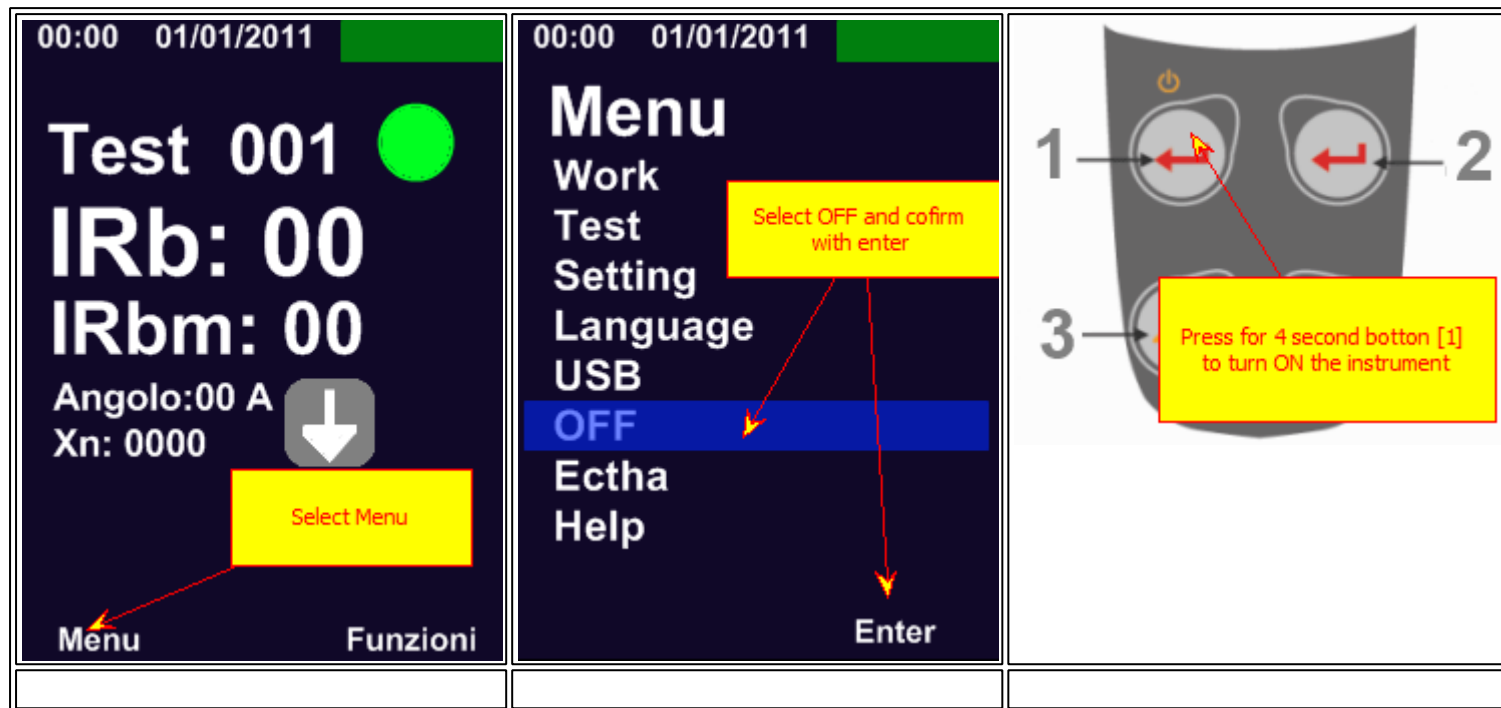


You can download the files by clicking [download Area](#), select **Mini SD Default** data and copy the entire files on the SD card.

6.11.4 Turn ON - OFF

Turn ON - OFF

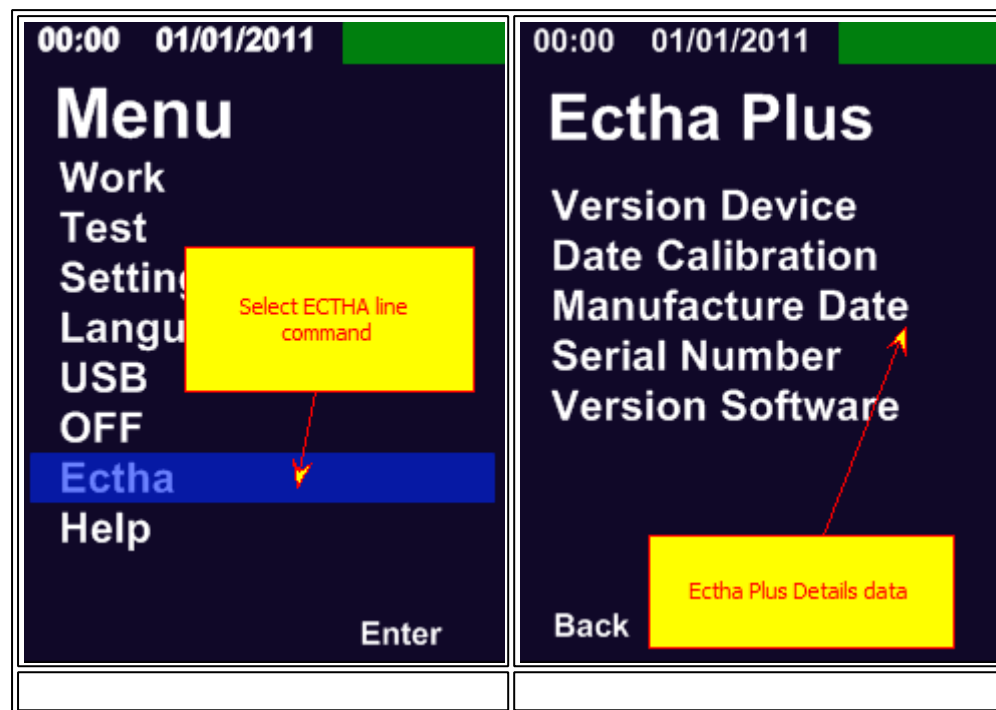
The ECTHA PLUS PRO can be turned OFF using the command OFF on the Keyboard.
This mode does not disconnect the batteries from the circuit board. This is recommended when there is a re-use within a short time.



6.11.5 ECTHA PRO

Ectha Plus Pro

The version information, serial number and calibration of the hammer are shown in this section.
Insert this information in the case of assistance



6.12 Update and Restore

Firmware Up-Date

The DRC Srl releases new versions of the firmware of the instrument with technical updates and improvements. Download the last version of firmware and update the instrument as follows instruction.

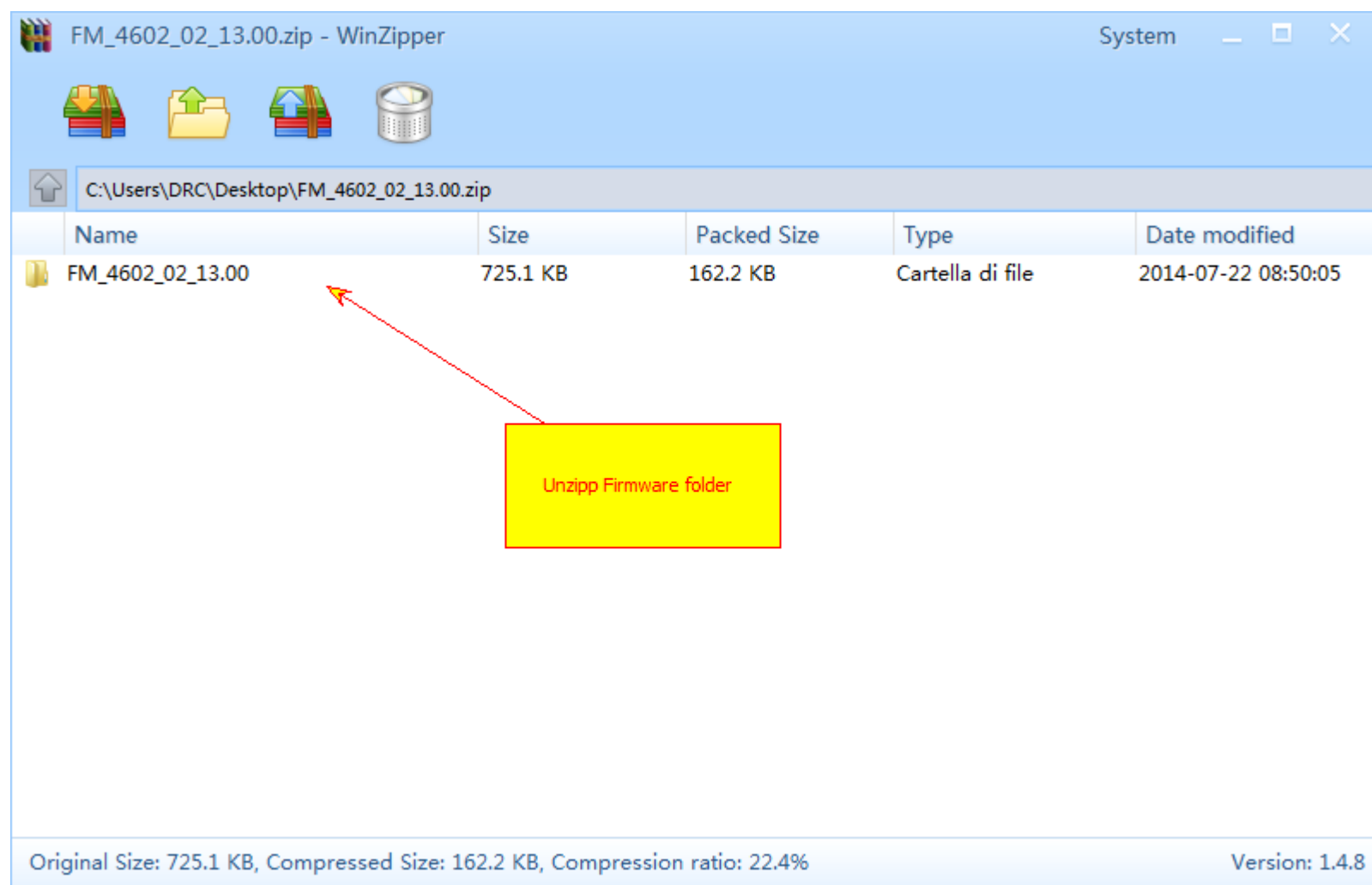
Download the zipped file "Firmware ECTHA Plus Pro V.XXXXX" from '[Download Area](#)' - ECTHA PRO PLUS.

Unzip the file. Inside you will find the files. HEX file and a. TXT

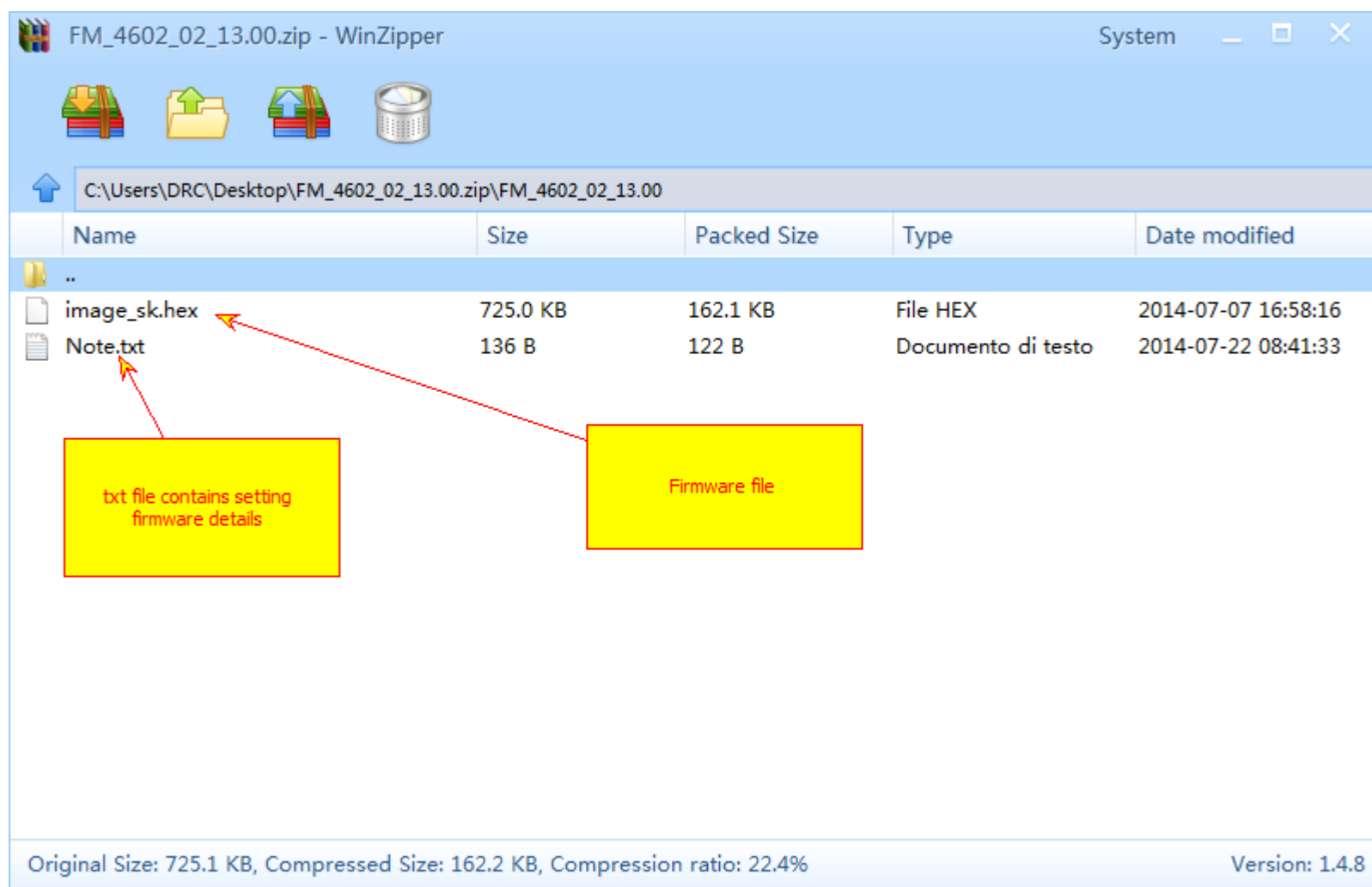
Copy both files to the SD card.

Turn ON the instrument, connecting the batteries, holding down both buttons simultaneously Arrow keyboard [3-4]. The firmware update process will be activated. The instrument display shows white screen intermittently. When the update tool reactivates functions with the new firmware.

Procedure:



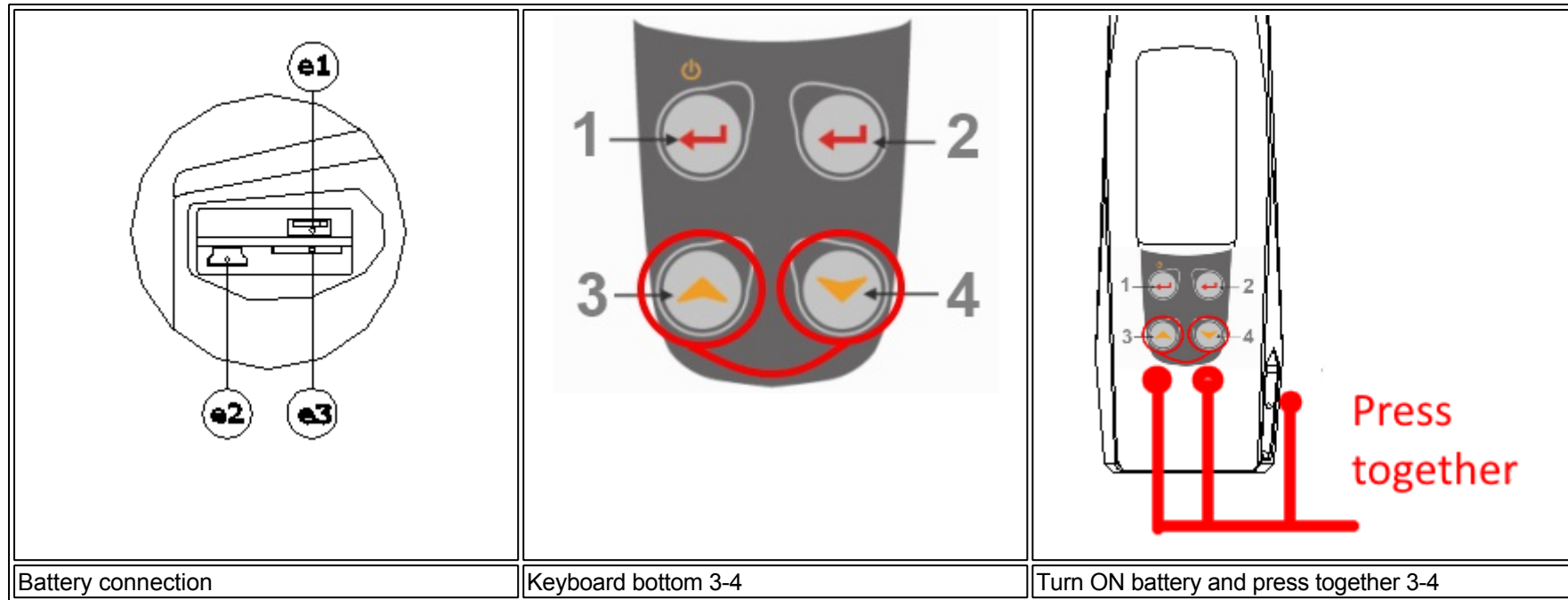
Select both files on the folder



Copy and replace both files on SD Card

Nome ^	Ultima modifica	Tipo	Dimensione
.fseventsd	27/05/2014 14:47	Cartella di file	
.Spotlight-V100	23/05/2014 14:11	Cartella di file	
.TemporaryItems	23/05/2014 14:12	Cartella di file	
.Trashes	23/05/2014 14:11	Cartella di file	
setting	04/09/2012 07:09	Cartella di file	
work	04/09/2012 07:09	Cartella di file	
._.TemporaryItems	23/05/2014 14:12	File TEMPORARYITE...	4 KB
._.Trashes	23/05/2014 14:11	File TRASHES	4 KB
image_sk.hex	12/09/2012 17:26	Firmware file.	731 KB
Note.txt	18/10/2010 17:28	Copy the new .HEX file on the SD card	1 KB

The new file must be copied to the folder with the same name. Use Copy and Replace windows function.



Restore

To restore the initial functions of the hammer copy the Mini SD default data available in [Download Area](#) of the instrument **ECTHA PRO**. Unzip the file and copy it entirely in the mini SD card.

Before you do this, copy all the saved data of the investigations carried out.

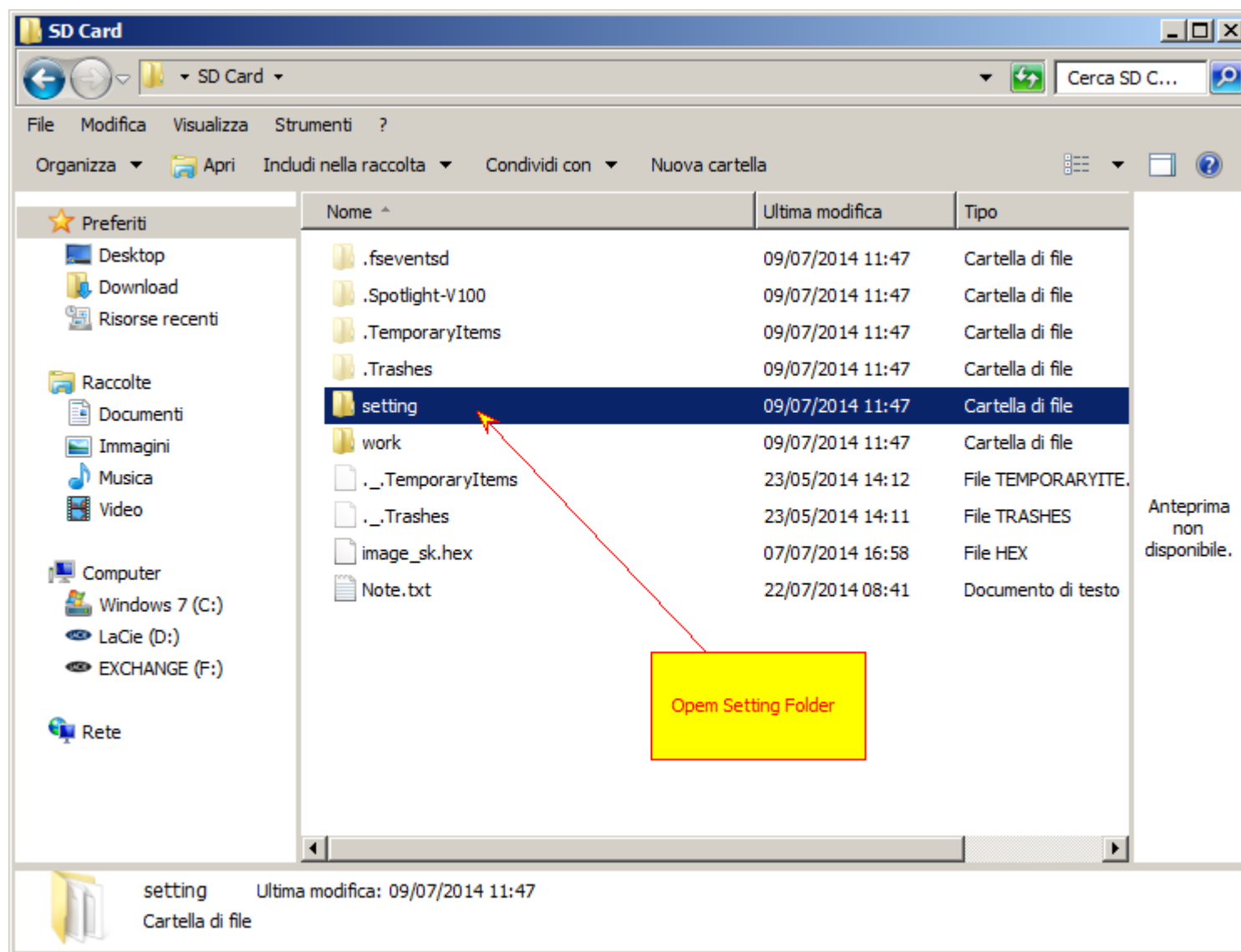
6.13 Diagnostic Log

Diagnostic LOG

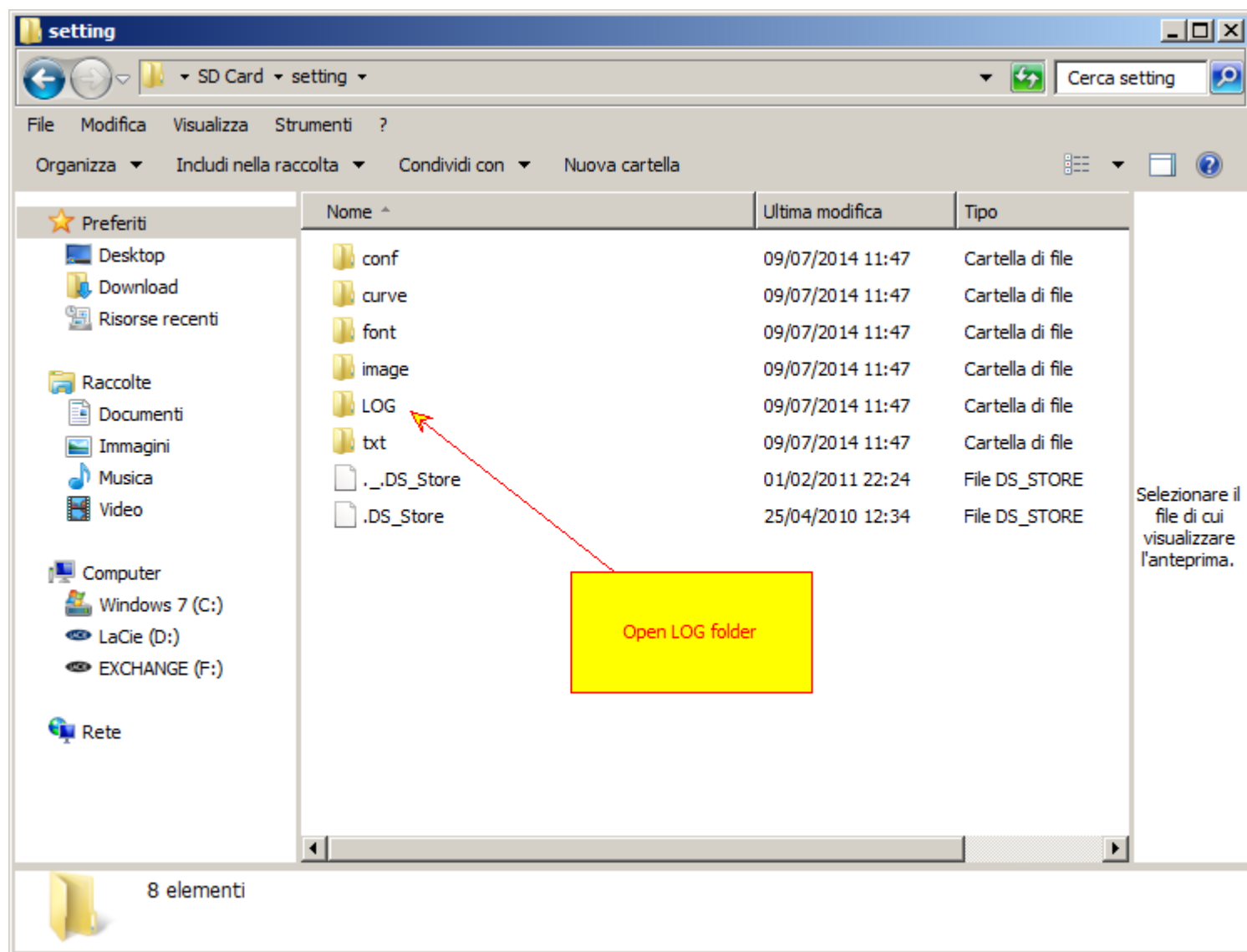
ECTHA Pro performs the self-test to verify the proper functioning of its components and internal functions.
See the diagnostic procedure in the [Settings](#) section.

At the end of the diagnostic procedure generates a LOG file with the report of the results of the monitoring process.
Send the file to the service center LOG.TXT DRC Srl

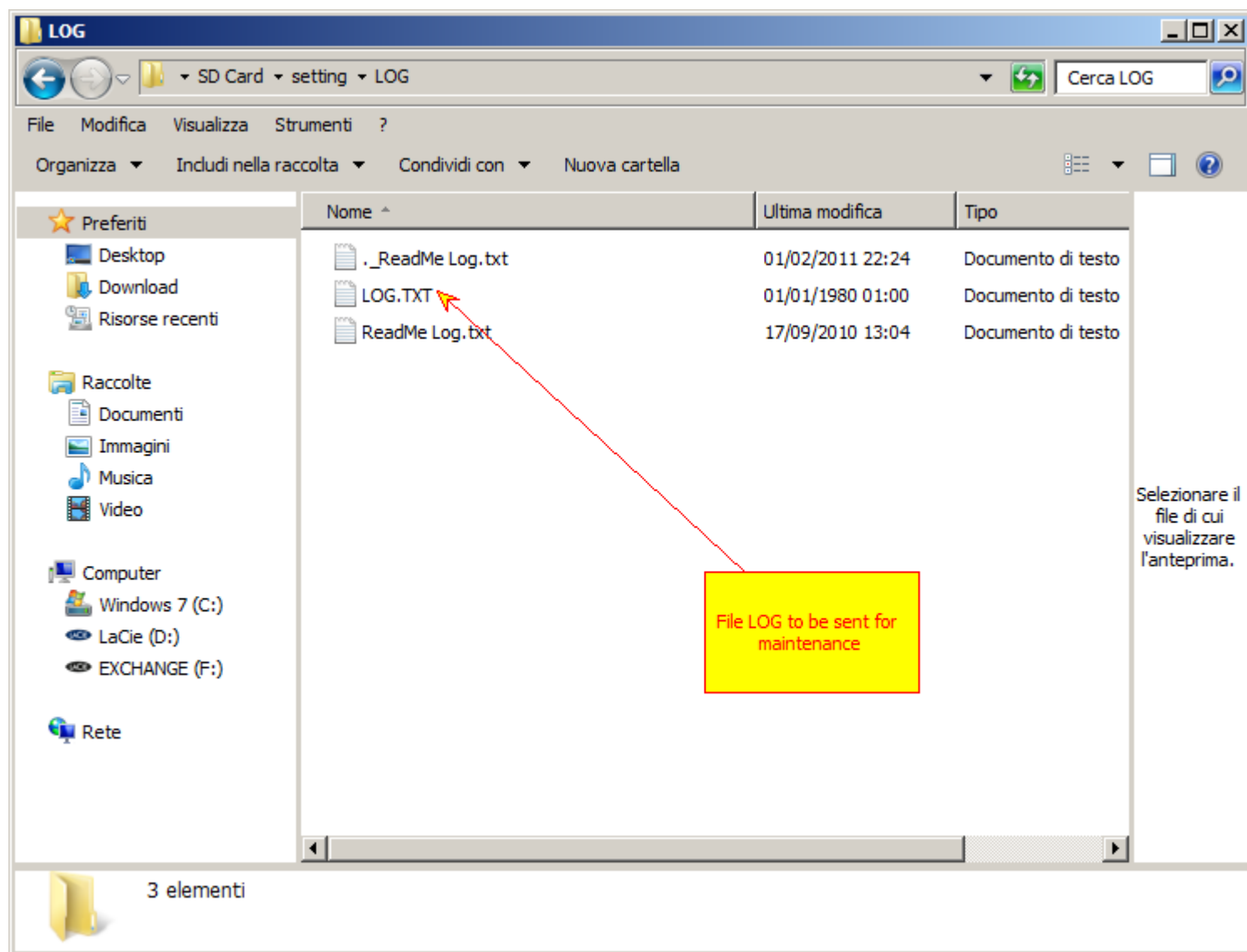
Open the SD card and browse to the folder setting



Open Setting Folder



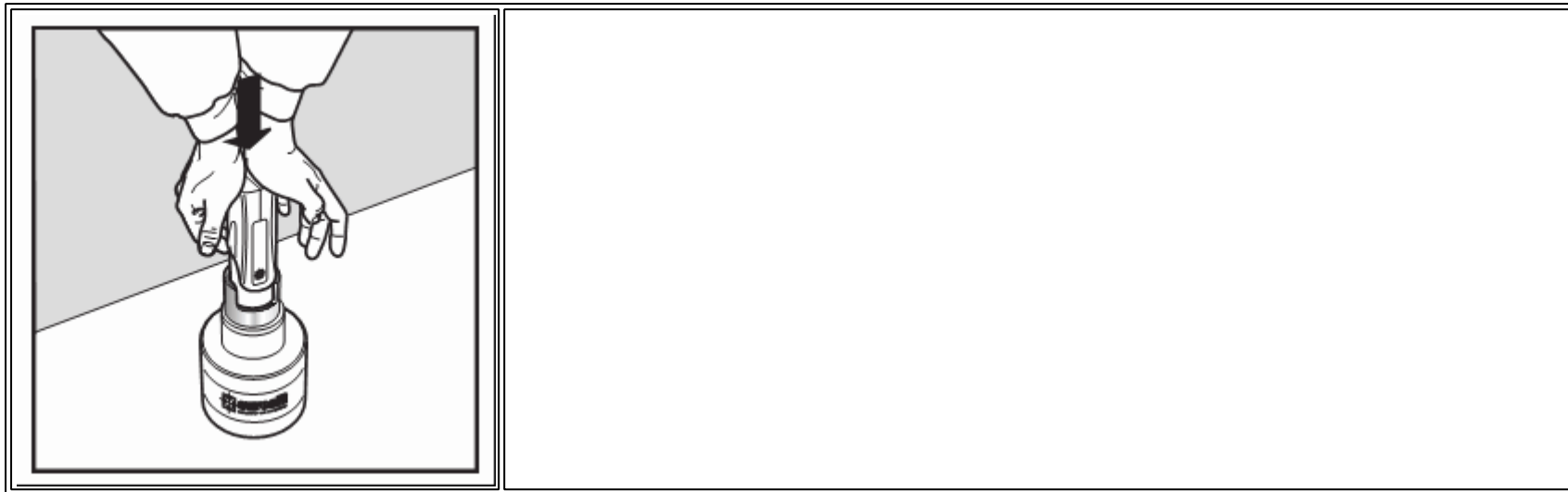
Copy and sent LOG file to assistenza@drcitalia.it



7. Calibration

Calibration Check

Insert the tool into the plastic guide and run a series of hit with the hammer (at least $X_n = 10$);
At the end of the test series, calculate the average value and check if it is within the tolerance range specified on the anvil (80 ± 3)



If the calibration check falls outside the tolerance DRC contact support.

Testing Anvil

The stainless steel calibration anvil [TAM100](#) for the sclerometer verification is characterized by a hardness of 57.60 HRC (Rockwell Hardness type C), by a mass of 16 kg and a diameter of about 150mm. The verification of the calibration of an anvil does not guarantee that diverse sclerometers will produce the same results in other points of the sclerometric scale. In order to verify the calibration of the sclerometer, the stainless steel anvil must be placed on a rigid surface.

Operate the instrument at least three times prior to initiating the readings from the calibration anvil, to ensure that the mechanics are operating correctly. Then, following this procedure, insert the sclerometer in the anvil guide ring and carry out a series of strikes (no. = 10).

The average bounce index of the sclerometric strikes performed with the sclerometer ECTHA1000 to the calibration anvil [TAM100](#) must be 80 ± 3 .

8. Standards

Standards

Concrete Test hammer ECTHA Pro and Testing Anvil calibration TAM100, made from the DRC have been constructed in conformity of follows standards:

- ▶ StandardISO/DIS 8045
- ▶ [EN 12 504-2](#)
- ▶ ENV 206
- ▶ [DIN 1048 parte 2](#)
- ▶ [BS 1881 parte 202](#)
- ▶ [ASTM C 805](#)
- ▶ NFP 18-417
- ▶ B 15-225
- ▶ JGJ/T 23-2001
- ▶ JJG 817-1993

9. Curves

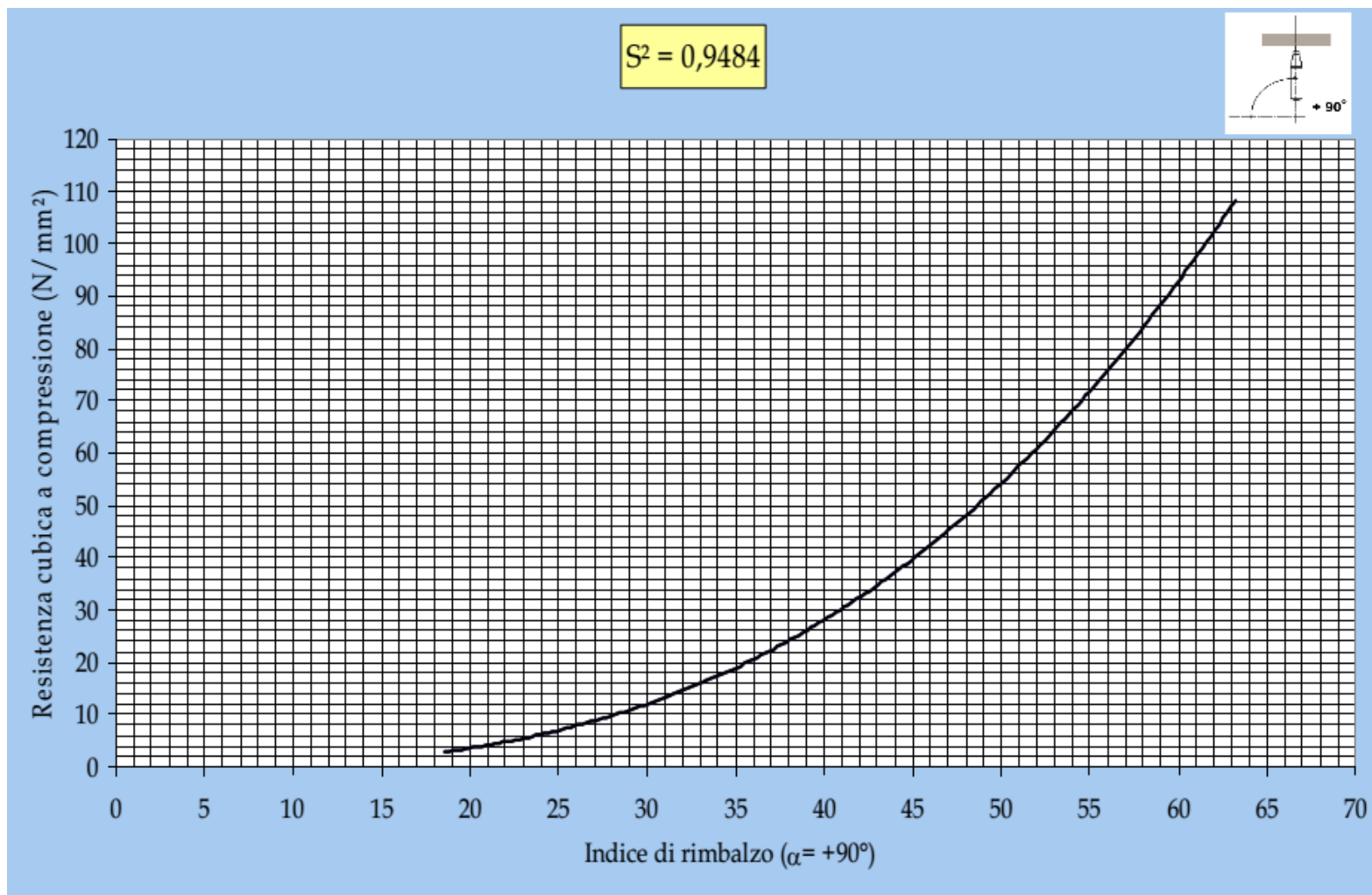
Correlation Curves

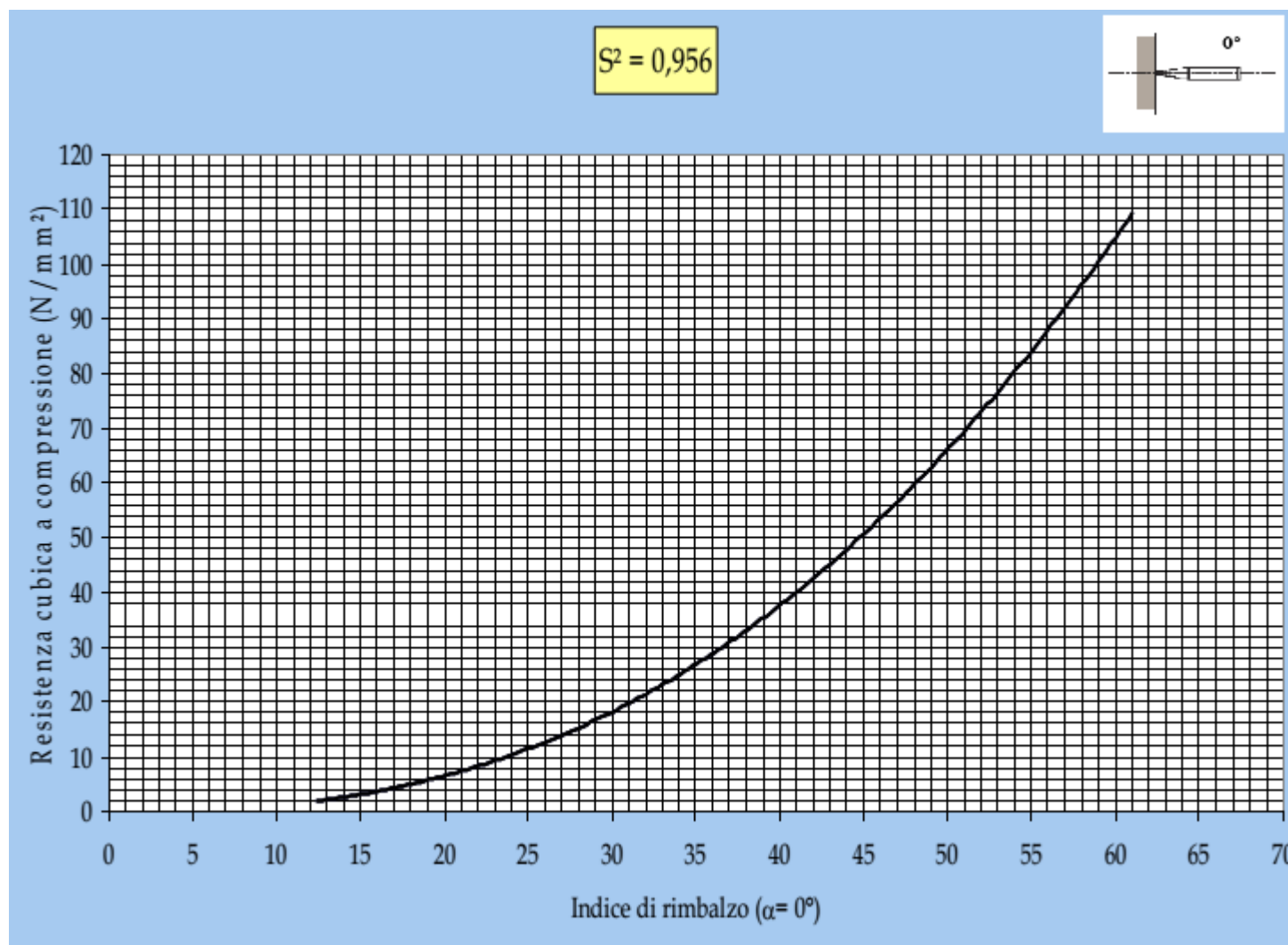
The correlation curves that follow provide an estimate of the compressive strength of the concrete. The curves are the results from experiments carried out by the DRC Srl with the Polytechnic University of Marche ([download area](#) - concrete with characteristics of central Italy).

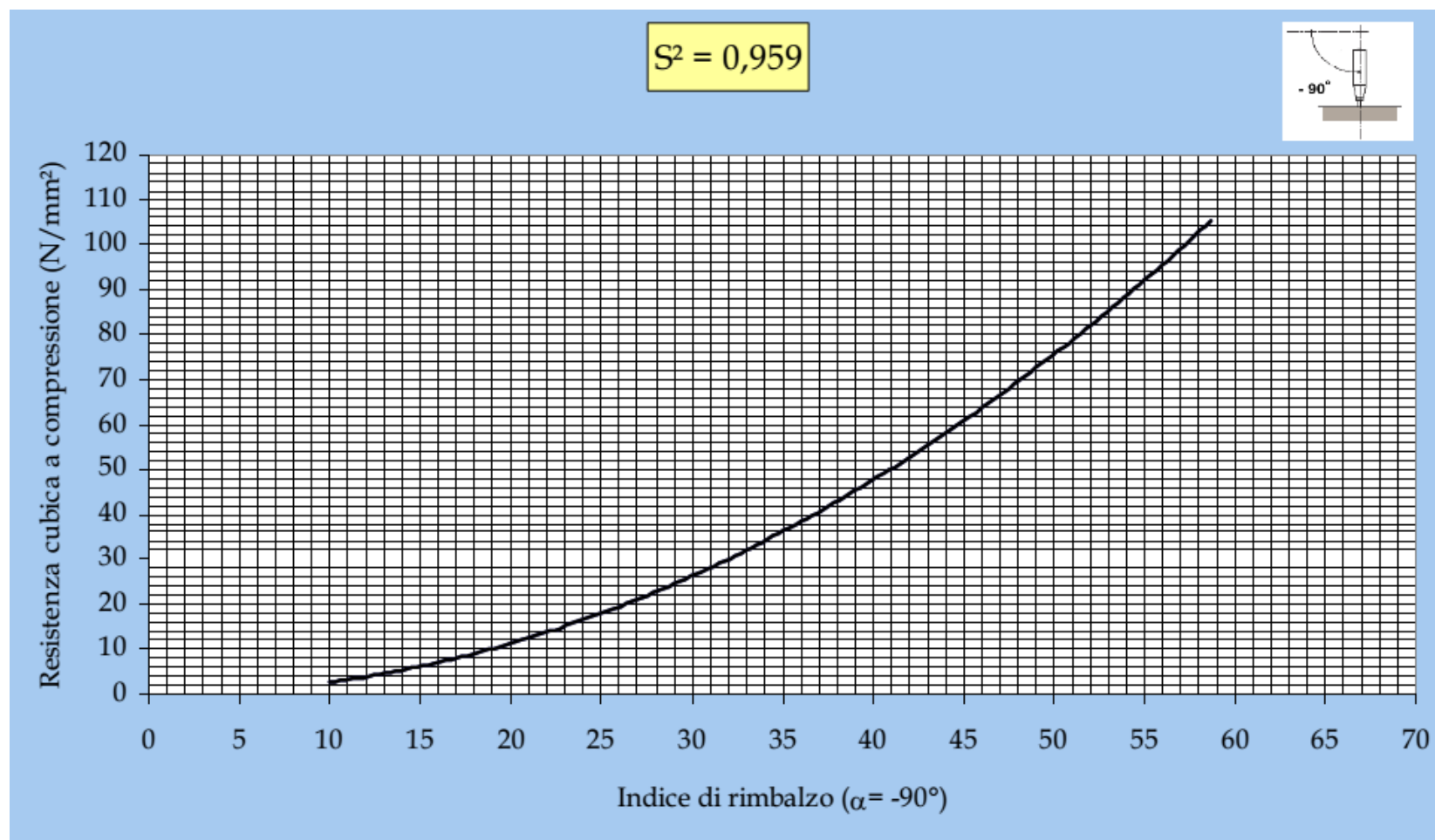
The curves are indicative and are used to estimate the compressive strength.

To determine the compressive strength is necessary to calibrate the hammer with the direct evidence and realize the correlation curves of the material.

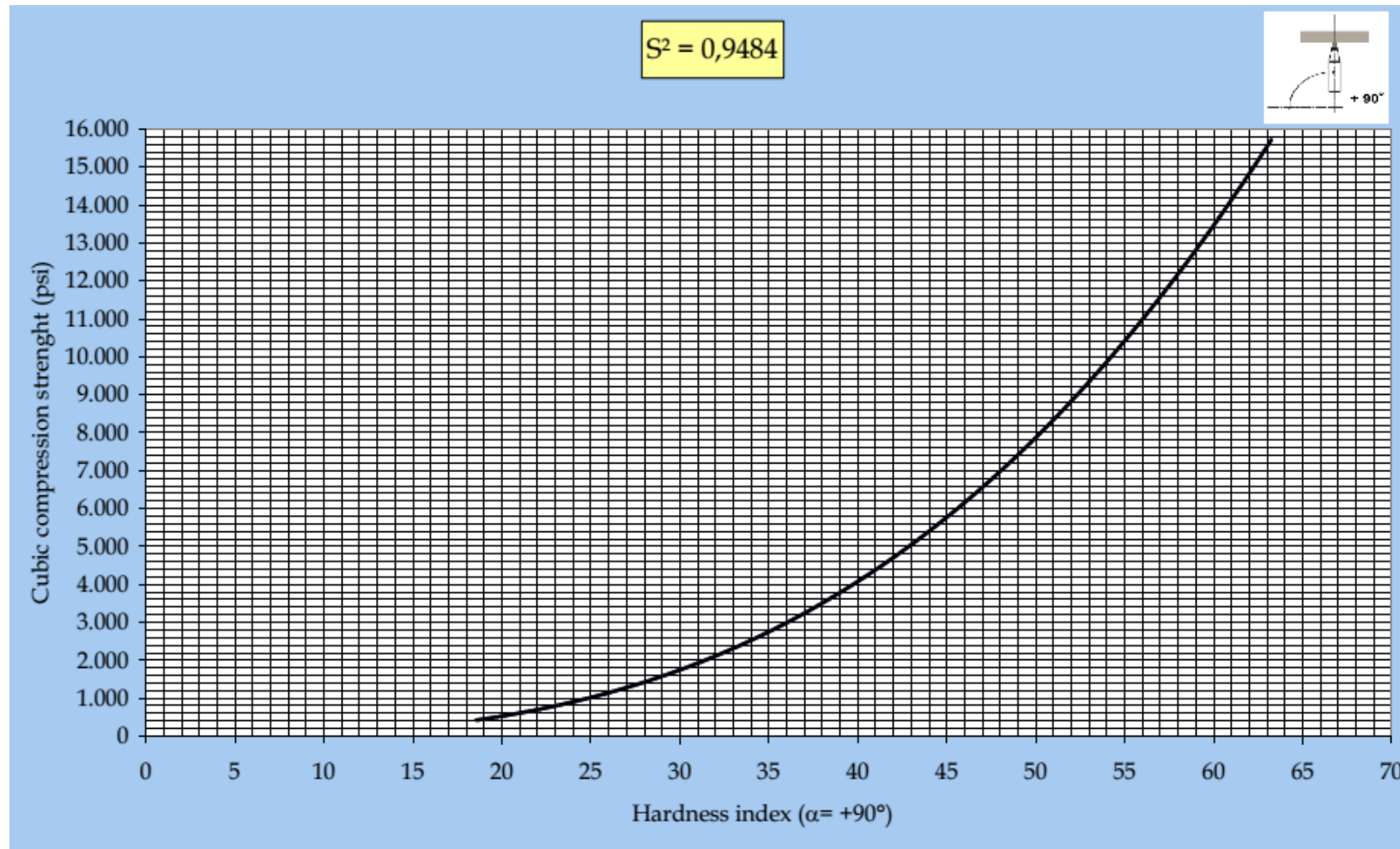
Curves MpA - DRC

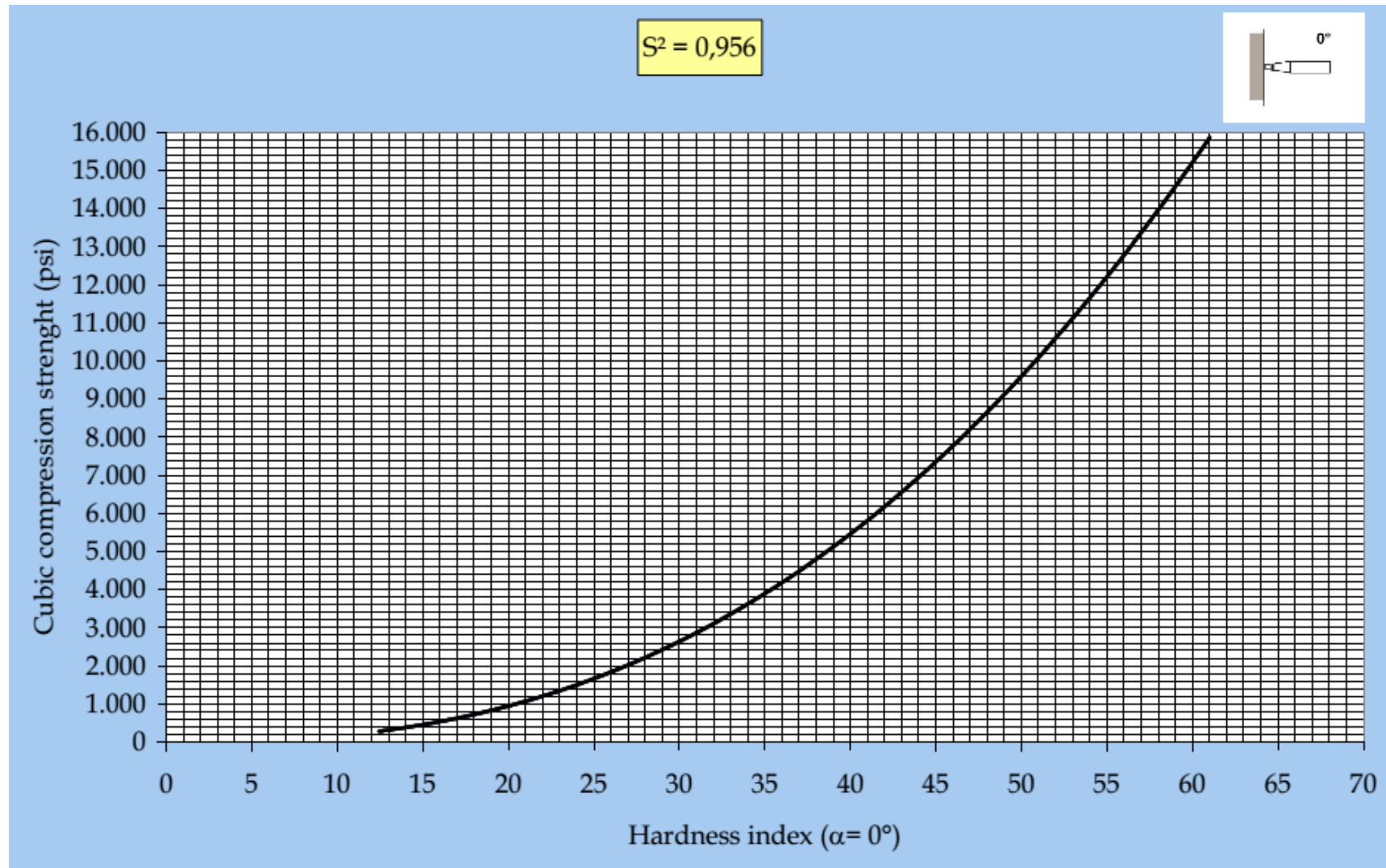


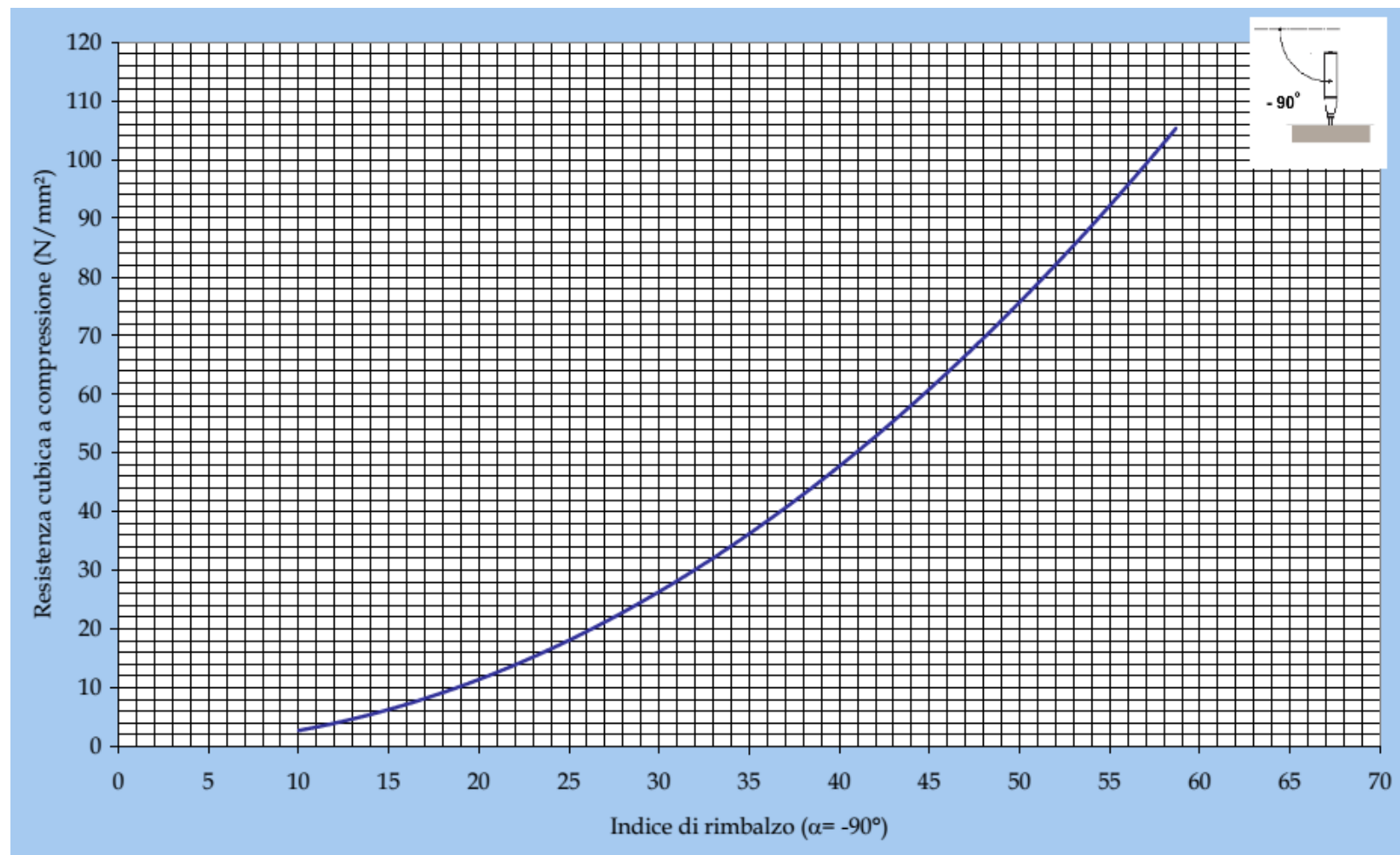




Curves PSI - DRC







10. Accessories

Accessories

ECTHA PRO is supply with below configuration:

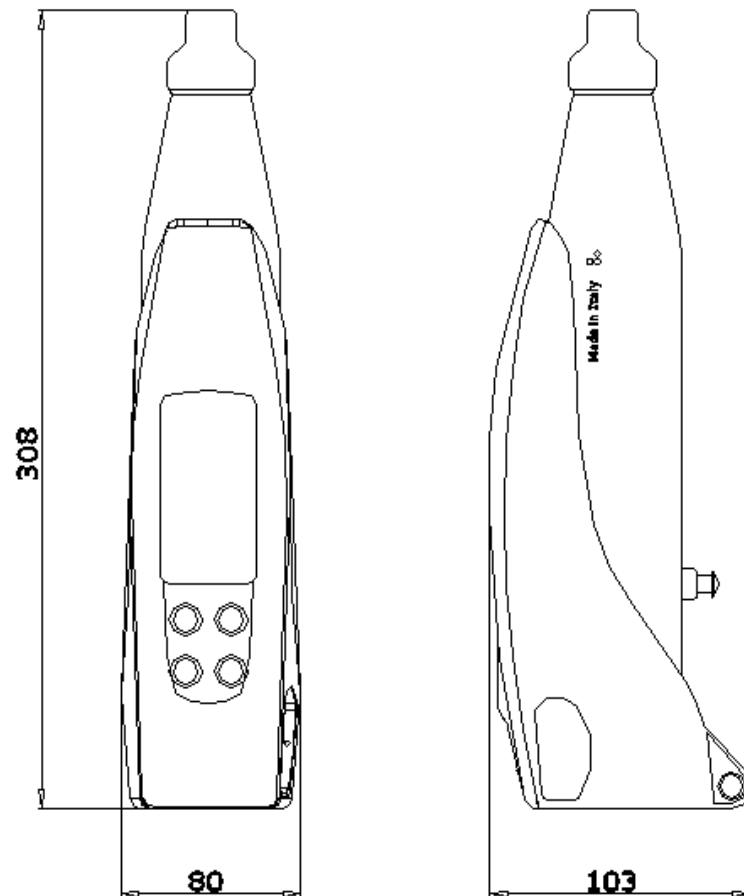
- ▶ Concrete Test Hammer ECTHA PRO
- ▶ Measurement sample
- ▶ Fenolftaleina
- ▶ Abrasion stone
- ▶ Rechargeable battery
- ▶ USB external battery
- ▶ Soft bag
- ▶ Software PC ECTHA W
- ▶ APP ECTHA-R

			
ECTHA PRO [01.DRC.0005]	SAMPLE [code 01.NON.0004]	FENOLFTALEINA [code 01.DRC.0026]	ABRASION STONE [code 01.DRC.0061]
			
RECHARGEABLE BATTERY [code 01.DGY.0001]	RIGID BAG [01.NEW.0001]	ECTHA PLUS - W [01.DRC.0200]	ECTHA-R

Testing anvil are not include on the ECTHA PLUS Pro KIT

11. Technical Data

ECTHA PRO



Performance

Measure Range: 5-120 N/mm²

Impact energy: 2,207 Nm

Limit thickness range: Thickness > 100mm

Mechanical

Case : aluminum Lega 6060 - 11S

Surface : Aluminium oxide

Impact mass: INOX 303

Handle : Plastic ABS-Nylon

Physical

dimension: 304 x 80 x 105

Net weight : 0,75 Kg

Package weight: 1,3 Kg (shipping weight)

Package dimension: 34 x 26 x 16 cm (shipping dimension)

Elettroniche

Board: PCB Intel processor

Display: graphic color display 64x128

Battery: litio 10h

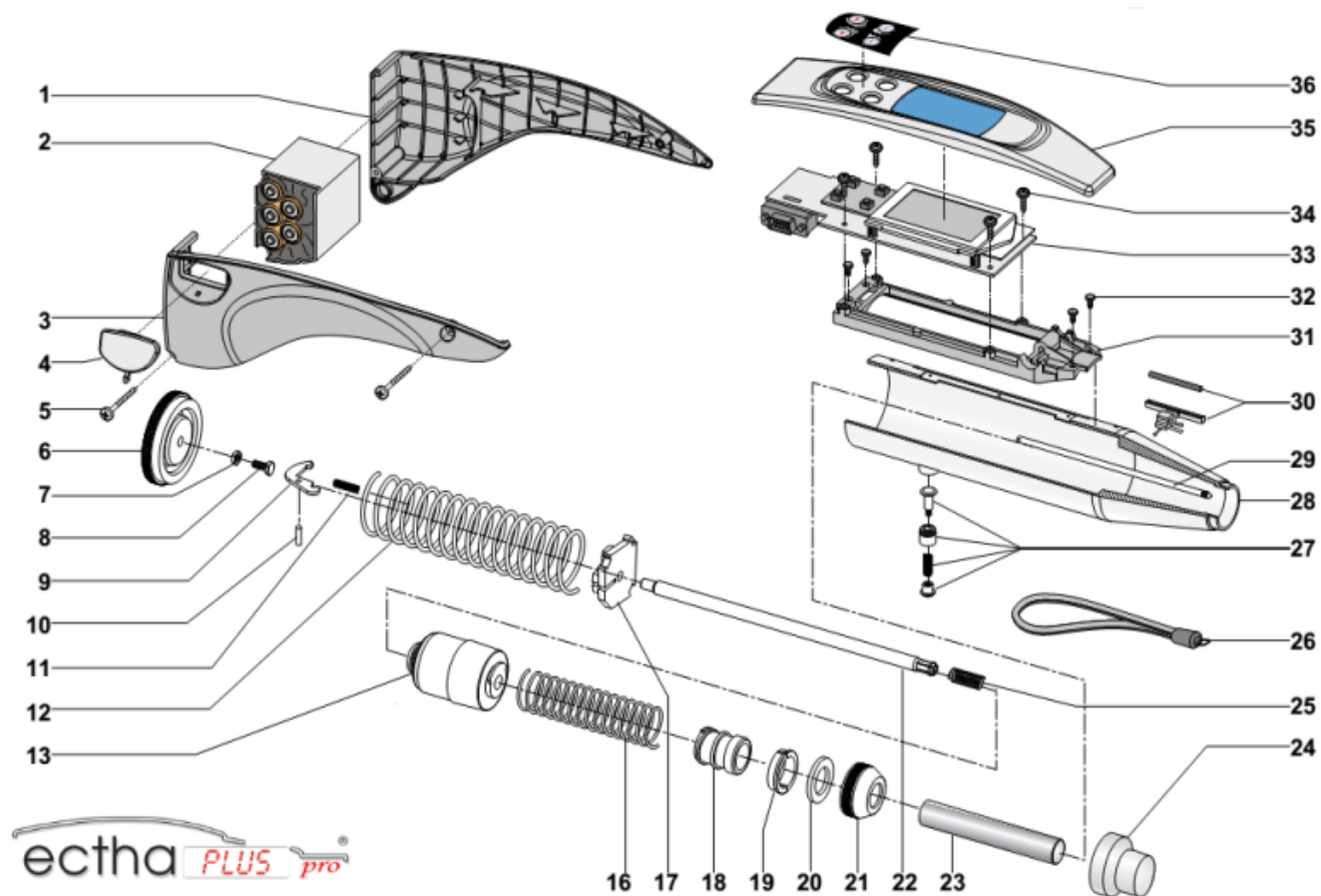
Displacement measurement: capacitive

Interface: USB

Memory : Mini SD 2Gb

11.1 Explosion view

ECTHA PLUS Pro Components



List of components

Pos	Code	Description	Pos	Code	Description
1	01.DRC.0092	Life side shell	19	01.TRE.0114	Block segment
2	01.DRC.0091	Batteries	20	01.DRC.0070	Washer
3	01.DRC.0093	Right side shell	21	01.TRE.0103	Push rod
4	01.DRC.0089	Cap	22	01.TRE.0111	Sliding beam
5	01.DRC.0094	Screw TCTC 35x42 for shell	23	01.TRE.0109	Percussion beam
6	01.TRE.0104	Rear cap	24	01.TRE.0116	Transport cap
7	01.DRC.0076	Nut M6	25	01.ADR.0001	Shock spring
8	01.DRC.0075	Screw TCE M6x14	26	01.DRC.0074	Belt
9	01.OMP.0001	Hook	27	01.TRE.0107*	Bottom
10	01.TRE.0115	Pin Hook	28	01.DRC.0098	Aluminum shell
11	01.ADR.0004	Hook spring	29	01.TRE.0113	Index beam
12	01.ADR.0002	Pression spring	30	01.DRC.0097	Index
13	01.TRE.0110	Hammer	31-32	01.DRC.0096	PCB plastic mounting + screw
16	01.ADR.0005	Rechargeable battery	33-34	01.DRC.0090	PCB board + screw
17	01.TRE.0108	Cable USB	35	01.DRC.0084	Top shell
18	01.TRE.0101	Percussion Spring	36	01.DRC.0107	Keyboard

12. Video Instruction

Istruzioni Video Sclerometro ECTHA

Ectha Plus Pro 2014

Remove transport cap

Calibration check

Test surface

Preparation of test surface


Performing test

Calibration Alpha TEST Machine

13. Download area

Documenti ed informazioni utili

All documents are available on ["Download area"](#)

	Instruction	Software and Application	Brochure and Data sheet
	Operating Manual ECTHA PRO.pdf Quick Tips ECTHA PRO.pdf Curves MPA - PSI .cvs Curves MPA Curves PSI	Firmware ECTHA PRO V.052015 SD restore files Software ECTHA-W V.052015	Brochure ECTHA PRO Pubblication ECTHA Technical note - Testing procedure Technical note - How it works Technical note - short procedure

14. Software and APP

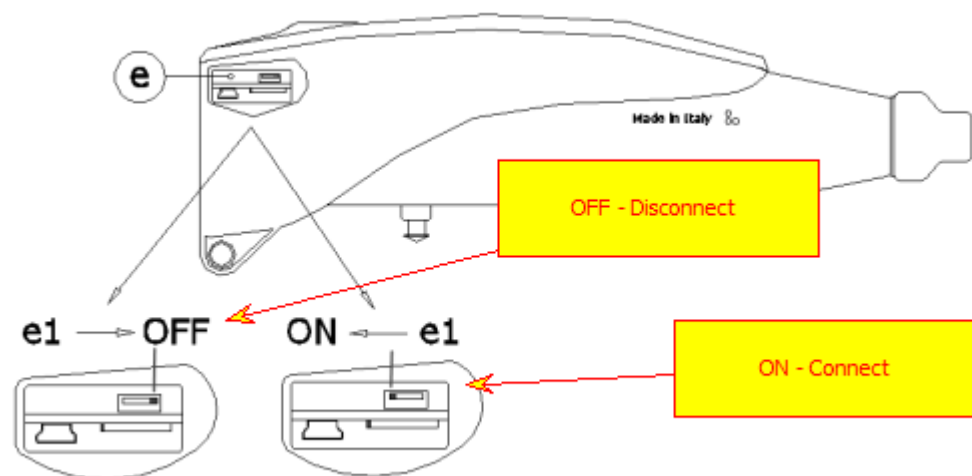
Software and Application

The values acquired by the electronic hammer ECTHA PRO can be viewed in real time through use of the APP ECTHA-R connected to the instrument thanks to Blue Tooth. The recorded files directly with the hammer on that APP can be analyzed and printed with the software ECTHA W that allows the creation of test report

	
Software for PC - Analysis and Report	APP for real time view and recorder data from ECTHA PRO

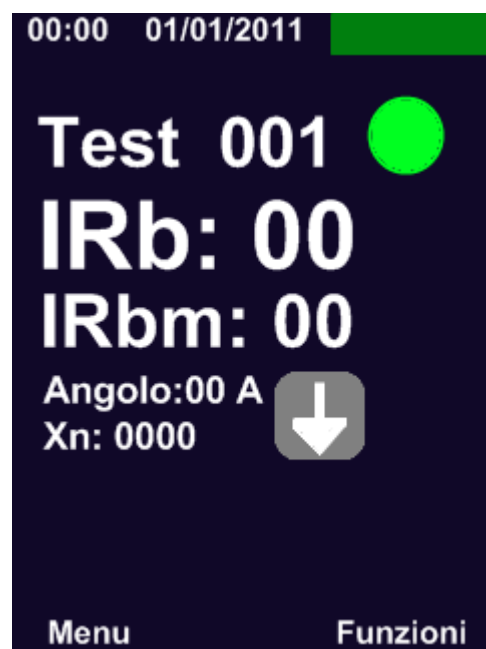
15. Quick Start Ectha Plus

1. Batterie_01A



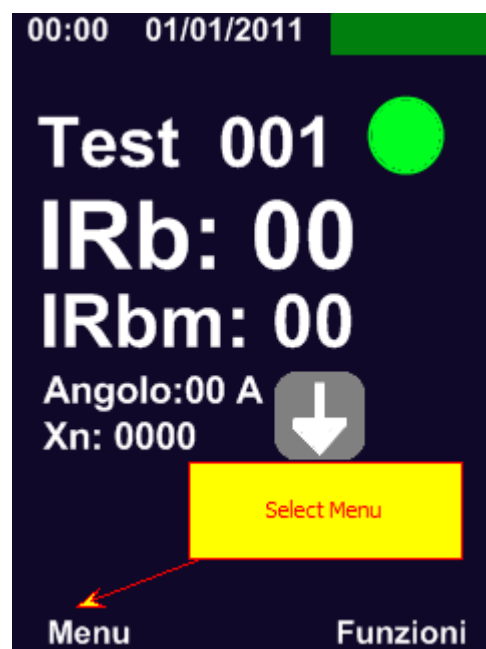
Turn on the Unit by connecting the battery

2. IMG_A000A_0006



Schermata di Lavoro

3. IMG_A000A_0003



Selezionare comando Menu

4. Imposta lingua



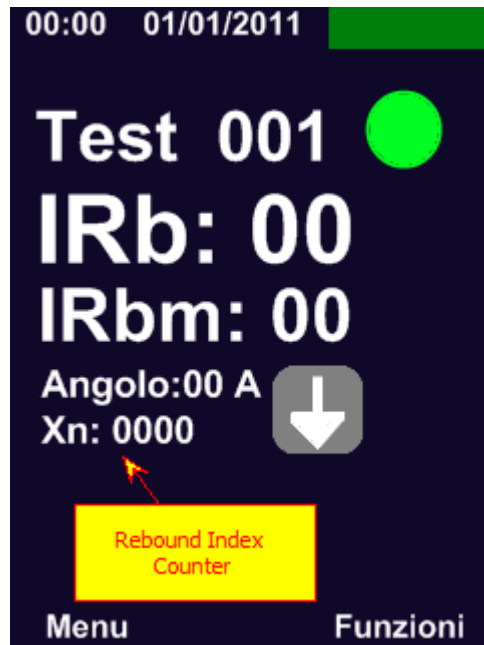
Select "language" line

5. Lingua ENG



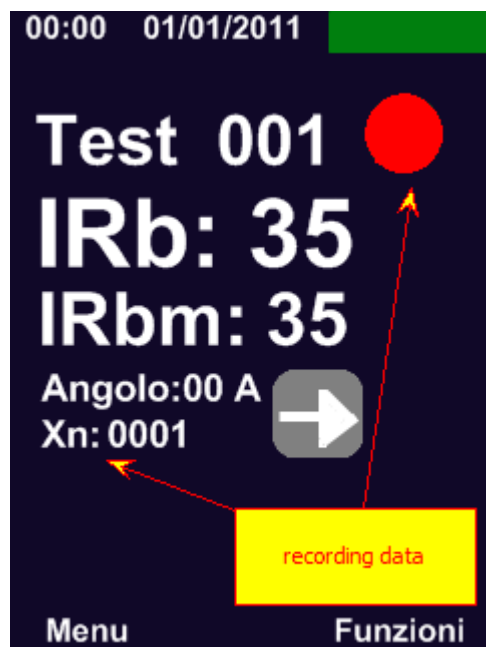
Select English

6. IMG_A000A_0002



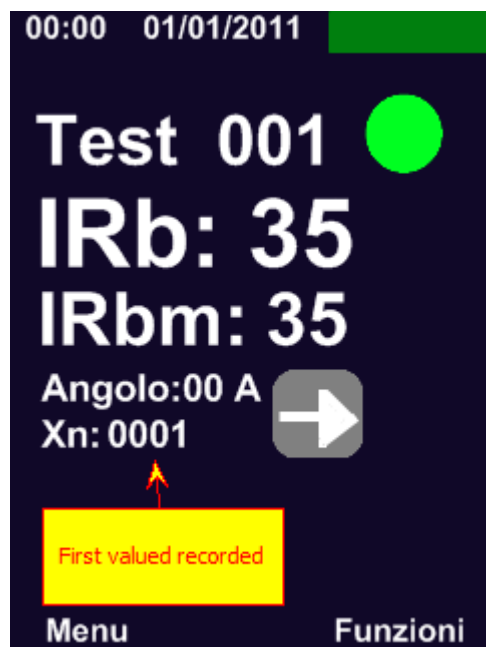
Performing Test.
Rebound counter is Zero
Green icon is ON. ECTHA PLUS Pro is ready to hit

7. IMG_VISU_001b



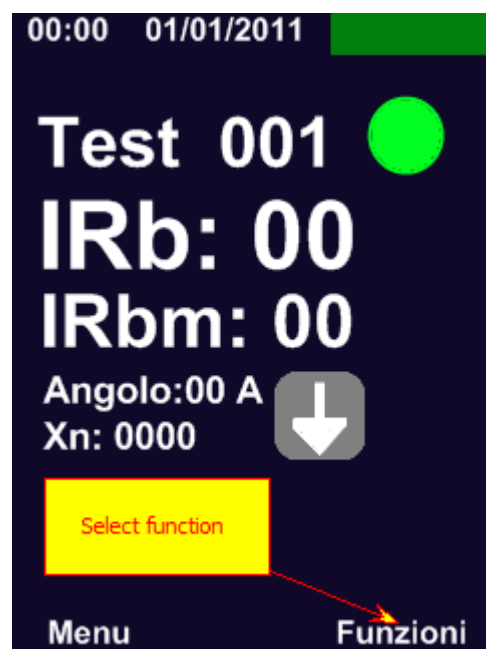
Ectha Plus Pro got a data.
Icon became red.
Counter Xn moved to 1

8. IMG_VISU_001a



Data was recorded.

9. IMG_A000A_0004



Select Function.

10. Funzione TEST



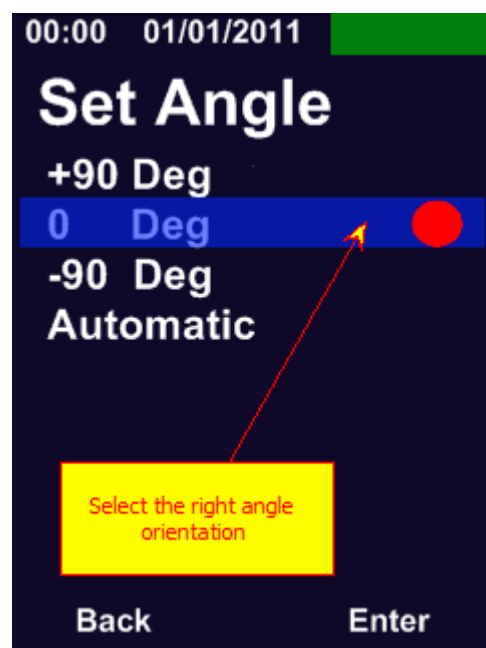
Seleziona comando Funzione per Registrazione Valori
su memoria SD

11. Angle 1



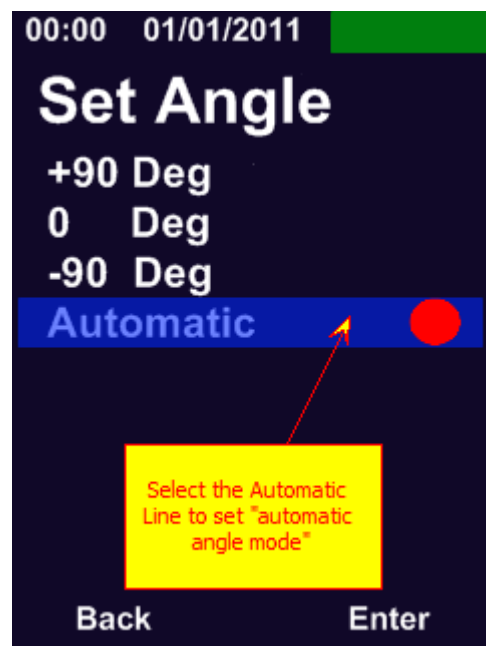
Select Angle line

12. Angle 02



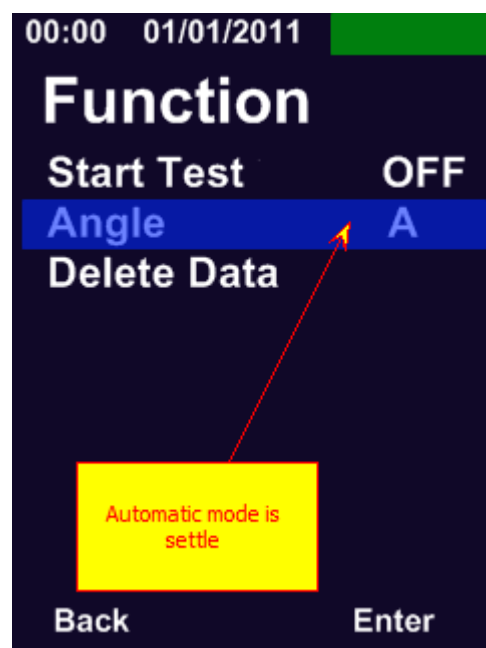
Select angle value

13. Angle



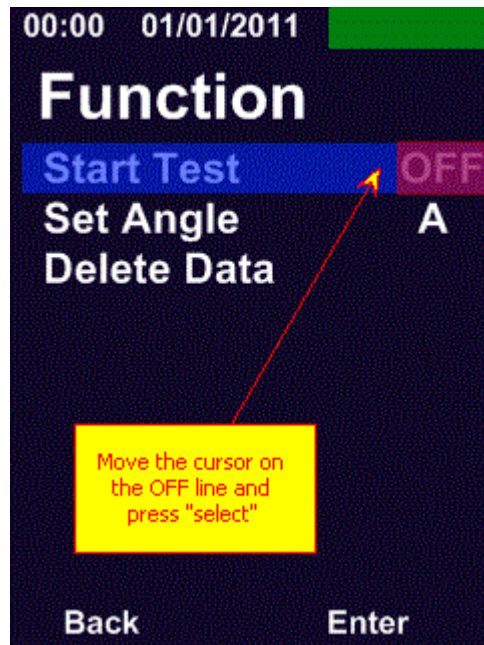
Select Automatic value

14. Angle 04



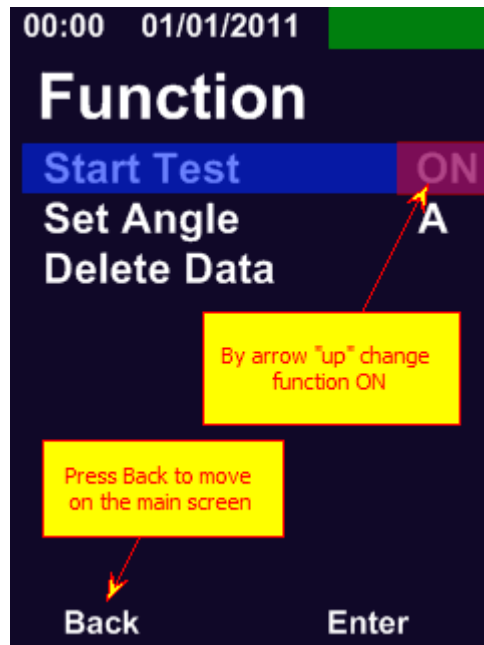
Automatic angle is settle

15. TEST OFF



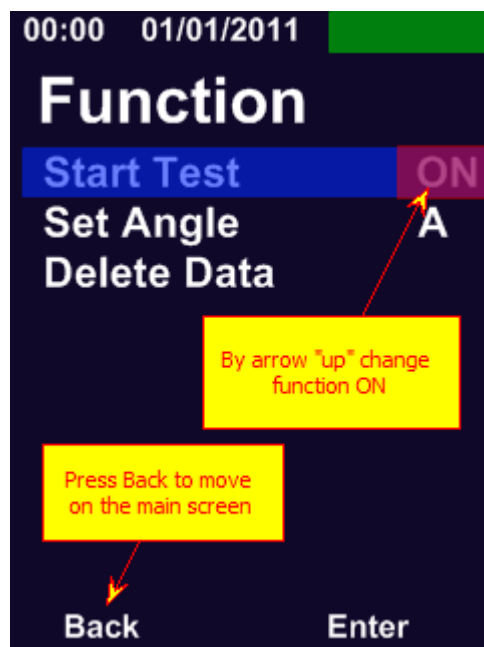
Select TEST command

16. TEST ON



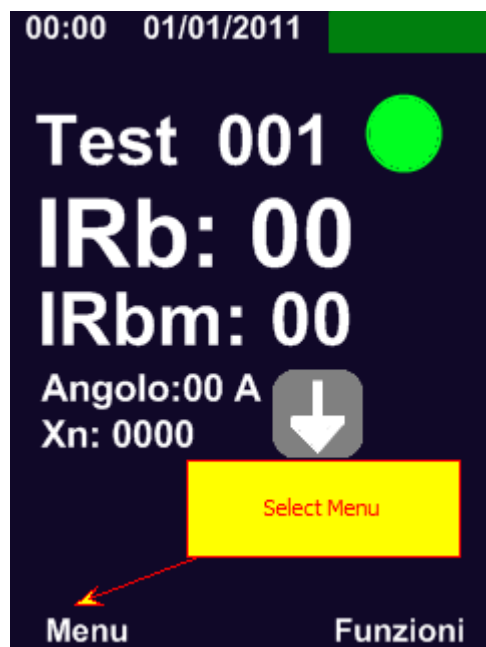
Select ON to activate recorder mode

17. TEST ON 1



Recorder icon is ON

18. Scarica dati



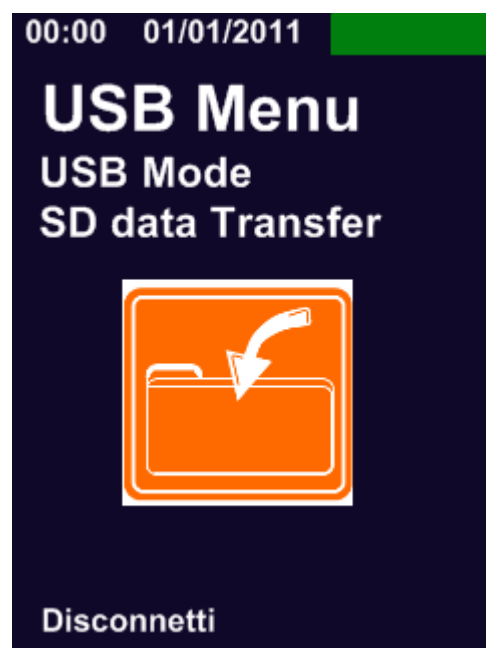
Seleziona comando Menu per lo scarico dei dati

19. IMG_USB_001



Connect the USB interface to PC
select USB command line

20. IMG_USB_003



Downloading data...

Index

A

accessories 3, 85
aggiornamento
analisi 44, 53
angle 29, 35, 38, 39, 102, 103, 104, 105, 106
angolo
applicativo
assistance 6, 9, 20, 21, 51, 62
assistenza 6, 72
attiva test
average 20, 22, 29, 30, 75, 76

B

batteria
battery 5, 23, 24, 25, 48, 85, 93
battuta

C

calibration 3, 5, 6, 11, 17, 18, 20, 21, 27, 62, 75, 76, 77
calibration check 18, 21, 75
calibrazione
cancella dato
certificate 6
certificato
componenti
components 11, 68, 88, 89
compressione
concrete 5, 6, 10, 11, 13, 17, 18, 20, 21, 22, 25, 27, 45, 46, 77, 78, 85
concrete test hammer 5, 6, 10, 11, 13, 17, 18, 20, 22, 25, 27, 45, 46, 77, 85
connessione batteria

connessione batterie

correlazione *44*

curve *3, 17, 45, 46, 78, 81*

curves *3, 17, 45, 46, 78, 81*

cvs *30, 31*

D

data *2, 3, 5, 6, 10, 11, 26, 27, 30, 31, 36, 38, 40, 41, 42, 44, 45, 50, 53, 56, 58, 59, 60, 67, 87, 99, 100, 112*

dati *109, 110*

default *45, 60, 67*

delate *37*

disconnessione batterie

download *3, 10, 22, 46, 53, 60, 63, 67, 78, 91, 112*

download area *3, 10, 60, 63, 67, 78, 91*

E

Ectha Plus - W *30, 31, 60*

erase *38, 40*

esploso

excel *30, 31*

F

formato *44*

Formazione

Funzioni

G

guscio

H

hex file *63*

I

impact *17, 19, 20, 21, 35, 38*

impostazioni *52*

indagine *40*

indice *40*

instruction *3, 10, 13, 18, 33, 63, 90*

istruzioni *90*

J

Job *26, 30, 31, 32, 33, 36, 38, 41, 43, 44, 46, 53, 57, 58, 59*

K

keybord *11*

L

lavoro *94*

lingua *95, 96*

M

maintenance *6*

manual *10, 23, 35, 38*

manuale

matricola

measurment *18*

media *11, 35, 40*

menu *2, 25, 27, 29, 38, 43, 46, 52, 95, 110*

misura

modifica angolo

MpA *17, 19, 20, 21, 22, 27, 35, 38, 45, 78*

N

Norme

O

ora *11, 20, 21, 30*

ora e data

orientamento

P

PC *5, 24, 53, 55, 85, 111*

production *4*

produzione

prova

prove 63

PSI 45, 81

R

rebound 10, 11, 20, 26, 28, 29, 30, 31, 42, 45, 46, 47, 60, 98

rechargeable 85

registra 2, 8, 28, 30, 102

report 5, 6, 11, 18, 22, 31, 68, 92

resistenza

ricarica

ricerca e sviluppo

rimbalzo 40

ripristino

ripristino funzioni 53

S

sclerometro 6, 90

SD 2, 23, 46, 49, 53, 55, 60, 63, 65, 67, 68, 102

serial number 6, 62

service 6, 8, 48, 50, 51, 68

settaggi

setting 2, 24, 26, 27, 29, 31, 33, 35, 36, 37, 38, 43, 44, 45, 51, 53, 55, 56, 60, 68, 70

software 3, 8, 22, 30, 31, 47, 60, 85, 92

spegnere strumento

spring 15, 17

standby 47

strumenti

supporto

T

taratura 6

tastiera

Test 2, 4, 5, 6, 10, 11, 13, 15, 17, 18, 19, 20, 21, 22, 25, 26, 27, 29, 30, 31, 32, 37, 38, 39, 40, 43, 44, 45, 46, 50, 51, 53, 58, 59, 68, 75, 77, 85, 86, 92, 98, 101, 106, 107, 108

training 4

turn off 25

U

update 2, 8, 62, 63

usb 2, 23, 24, 25, 43, 53, 85, 110, 111

V

viewing mode 26, 28, 36, 39

visualizzazione 40

W

work 2, 5, 9, 15, 17, 24, 27, 30, 31, 35, 36, 39, 41, 55, 56, 60